IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 486 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAY 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

Alliance "Tenna-Rotor" Model U-98

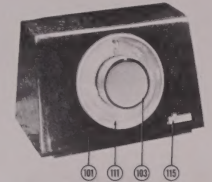
The following information on the Alliance Tenna — Rotor Model U-98 is presented through the courtesy of Alliance Manufacturing Co., Alliance, Ohio.

GENERAL INFORMATION

The Alliance Tenna Rotor, Model U-98, is an improved fully automatic unit. The control of this unit is actuated by a solenoid instead of the electro-magnet used in the U-83 Automatic Tenna Rotor. The control knob is turned to the desired direction and the rotator automatically rotates the antenna to that position and stops. The dial lights up when the direction is selected and turns off when the antenna reaches that position. The unit operates at a speed of two RPM, with a motor brake to prevent drifting and windmilling. The U-98 is directly interchangeable with the Model U-83.

The U-98 rotor can be identified by the grey weathershield.

The U-98 rotors manufactured after June 1, 1958 operate at a speed of one RPM. These can be identified by the date stamp on the rotor and by the serial number on the control box. Serial number U840501 and over are one RPM. Earlier Model U-98 rotors may be converted to one RPM by use of our RCR Kit A.



Control Box—Model U-98.

SERVICE PROCEDURE

Power-off Checks

1. Viewing from front, left pawl (Item No. 121) should clear slotted escapement disk by .010 inch to .035 inch with solenoid in energized position.

2. Right pawl (Item No. 121) should clear slotted escapement disk by .010 inch to .035 inch with solenoid in de-energized position.

3. Left pawl must come to rest in any given stop position. After stop position is reached, depress plunger in solenoid by hand to make sure pawl drops freely into slot. Adjustment is made by moving indent spring assembly (Item No. 133).

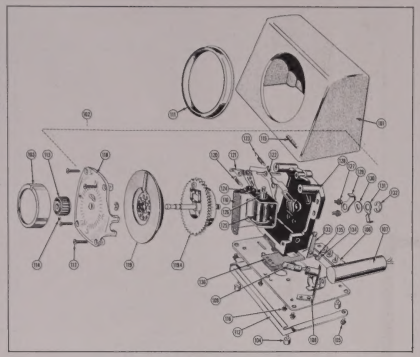
4. Contact spring (Item No. 27) in the rotor unit must make contact only when cam lobe (Item No. 41) comes in contact with the switch.

5. Be sure that four-conductor cable is connected to proper terminals. Terminal No. 1 in the rotor connects to No. 1 on the control case and so on with No's 2, 3, and 4.

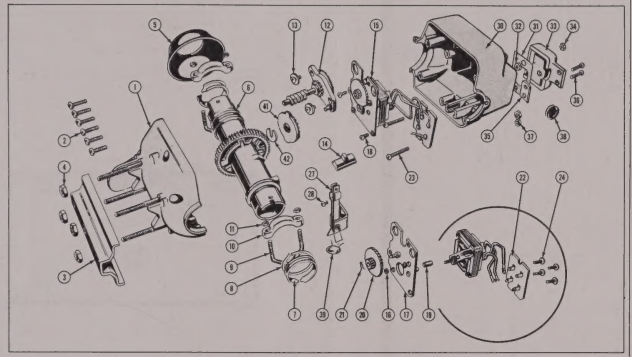
6. Check length and size of four conductor cable.

7. Primary input contacts should be .020 inch apart. Adjustment can be made at factory only.

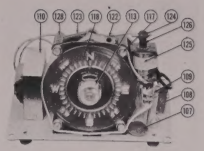
8. Red pointer on dial face should point to the direction which corresponds with the antenna at the stop position. This adjustment is made by removing the knob and inserting a narrow tool through the elongated radial slot to the gripping holes in the pointer and turning the pointer to the correct position.



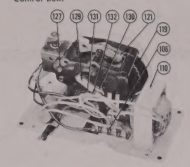
Exploded View of Model U-98 Control Box.



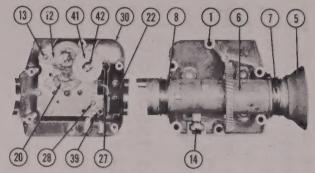
Exploded View of Model U-98 Rotator Unit.



Internal Components—Model U-98 Control Box.



Internal Components—Model U-98 Control Box.



Internal Components—Model U-98 Rotator Unit.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE
Rotator fails to operate when knob is turned to desired direction.	If motor is operating: Check gear train for improper meshing or slippage. If motor is inoperative: Press tuning spring — if box mechanism operates properly, the trouble is not in the solenoid, transformer or the mechanical parts of the escapement assembly. Check input contacts to be sure they are closed. Check terminals 1-3, or 2-3, depending upon desired direction of rotation for approximately 24 volts. Check contact springs on the frame assembly for proper contact with rings. Check capacitor in control.
Rotor operates slowly or sluggishly	Check contact switch in rotor for proper operation. Switch should close when cam lobe hits switch blade. Check motor for shorts or open connections. Check hook up of four conductor cable. Check size and length of four conductor cable. (See Figure 4) Change capacitor
Light fails to go off at stop position.	Check synchronization per instructions on bottom of control case. Input contacts improperly adjusted.
Light fails to come on.	Bulb bad or socket connections loose.
Rotor operates - light on, but control fails to operate. (Note: In some cases rotor may not operate with these symptoms because the voltage drops approximately 5 volts at the control box.)	Check for short between terminals 3 and 4 or short from terminal No. 4 to casting of rotor or chassis of control. Check capacitor (Item No. 39) across contact switch (Item No. 27) for short.

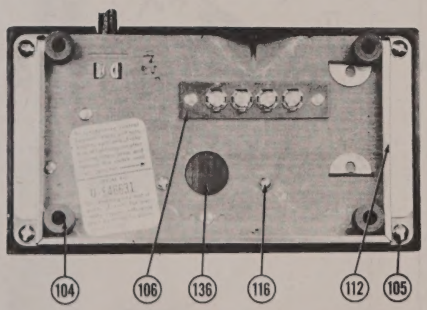
PARTS LIST

ITEM	NAME	PART No.
	Rotator Assembly	Z-5471-R
1	Housing Assembly RH	Y-5454-R
2	Housing Screws	10-32 x 3/4
3	Clamping Plate	X-5456-A
4	Nut, Hex	1/4 x 20
5	Weather Shield	X-3375-C
6	Shaft Assembly	Y-5463-S
6A	Shaft Assembly (1RPM)*	Y-5463-T
7	Bearing Collar	X-3987-A
8	Thrust Washer	X-3376-A
9	U-Bolt	X-3377-A
10	Mast Clamp	X-3319-A
11	Nut, Hex	10-32
12	Worm Assembly	Y-5474-R
12A	Worm Assembly (1RPM)*	Y-5474-S
13	Screw, RH Washer	8-32 x 3/8
14	Stop Slide	X-3320-A
15	Motor & Term. Assembly	Y-5714-S
16	Nut, Hex	6-32
17	Mounting Plate Assembly	X-4263-R
18	Screw, RHM	8-32 x 3/8
19	Spacers	X-4141-A
20	Gear & Pinion Assèmbly	X-3373-R
21	Retaining Ring	X-4243-H
22	Terminal Plate Assembly	X-5700-R
23	Screw, RHM	8-32 x 1
24	Screw, Binding Head	6-32 x 5/16
27	Contact Switch Assembly	Y-5908-R
28	Screw, RHM	6-32 x 3/16
30	Housing Assembly	Z-5326-B
31	Gasket	X-5449-A
32	Nut, Hex	8-32
33	Terminal Cover	Y-5327-A
34	Nut	8-32
35	Strain Relief Clamp	X-3380-A
36	Screw, RHM	6-32 x 1/2
37	Nut, Hex	6-32
38	Grommet	X-3387-B
39	Capacitor .01 ceramic	X-8533-B
41	Cam and Gear	X-5584-B
41A	Cam and Gear (1RPM)*	X-4292-B
42	Spring Clip	X-2825-A

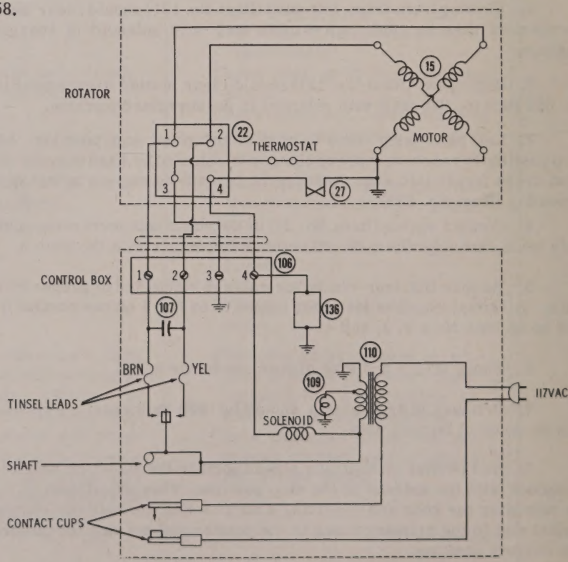
*Used on one RPM Rotors manufactured after June 1, 1958. Serial #U840501 and over.

PARTS LIST

ITEM	NAME	PART No.
	Control Box Complete	Z-8515-R
101	Case	W-5559-A
102	Frame & Dial Assembly	Z-8516-R
103	Knob - brown	X-8529-R
	Knob - ivory	X-5556-R
104	Bumper	X-5628-A
105	Screw, RH Washer	8-32 x 3/8
106	Term. Strip Assembly	X-3803-S
107	Capacitor	X-4098-A
108	Light Socket Assembly	Y-5558-R
109	Bulb (Type 47)	X-4274-A
110	Transformer	Y-5512-A
111	Bezel	Y-8525-B
112	Trim Strip	Y-8528-A
113	Knob Hub	X-5555-A
114	Set Screw	S-614-N
115	Emblem	X-8530-A
116	Screw, Self Tapping	6-20 x 1/2
117	Screw, Self Tapping	6-20 x 5/8
118	Dial	Y-8519-A
119	Spring Motor & Hub Assembly	Y-8534-R
119A	Detent Body Assembly	Z-5524-R
120	Pawl Spring	X-5667-A
121	Pawl	X-8518-A
122	Pawl Lifter Assembly	X-8512-R
123	Spring Tension	X-8520-A
124	Grommet	X-8509-A
125	Solenoid Assembly	Y-8511-R
126	Plunger	X-8504-A
127	Screw, Hex H. Washer	6-32 x 1/2
128	Frame Assembly	Z-5515-S
129	Stop Lever	X-5537-A
130	Spring Washer	X-5568-A
131	Terminal	X-5540-A
132	Retaining Ring	X-4243-B
133	Indent Spring Assembly	X-5518-R
134	Screw, RHM	6-32 x 3/8
135	Washer	5/16
136	Tuning Spring	X-5563-A



Bottom View of Model U-98 Control Box Showing Terminal Strip.



Schematic Wiring Diagram—Model U-98.

PHOTOFACT® Folder

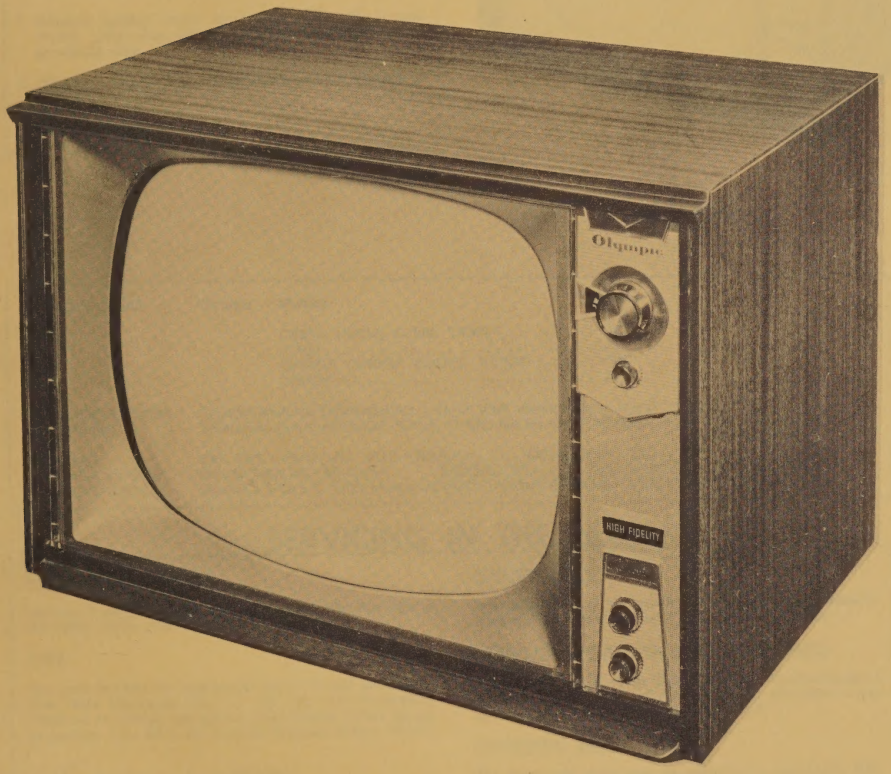
OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146



OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

MODEL TE-202 (Ch. JE)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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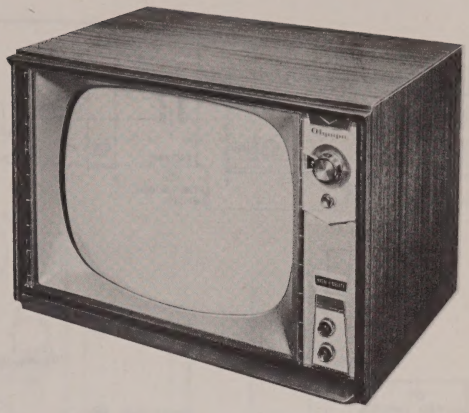
OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL TE202

1. Remove 1 wood and 1 metal screw holding rear cover. Remove rear cover.
2. Remove 6 push-on type knobs from front of cabinet. Remove 1 wood screw holding Front escutcheon. Remove 3 push-on type knobs now visible.
3. Remove speaker leads, hi voltage lead, picture tube socket, yoke plug, and picture tube mounting bracket grounding wire.
4. Remove 3 chassis bolts from bottom and 1 from back of cabinet.
5. Remove chassis.



MODEL TE-202 (Ch. JE)

TRADE NAME	Olympic	Models	Chassis
		CE208, CE209, KE220, TE202	JE
		CJ442	JJ
		CE208U, CE209U, KE220U, TE202U	JEU
		CJ442U	JJU
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th Avenue, Long Island City 1, N. Y.		
TYPE SET	Television Receiver (Model KE220, U with AM Receiver Chassis 146 and 4 Speed Automatic Record Changer)		
TUBES	TV: VHF - Seventeen, UHF - Eighteen AM Receiver: Five		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING TV: 1.45 Amp. @ 117 Volts AC (Less UHF)		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the Top edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for Horizontal Sweep Circuit protection. (See "Tube Placement Chart".) One fuse wire is used for Filament protection and one for Low Voltage Power Supply protection. (See M3 & M4 in photo "Chassis Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, remove Channel Selector, Fine Tuning knobs and Front Escutcheon.

AGC

The AGC may be varied by means of a Local-Distant Switch. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

SYNC STABILITY

Sync stability may be varied by means of a Sync Stability Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Size Trimmer. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Clarifier adjustment for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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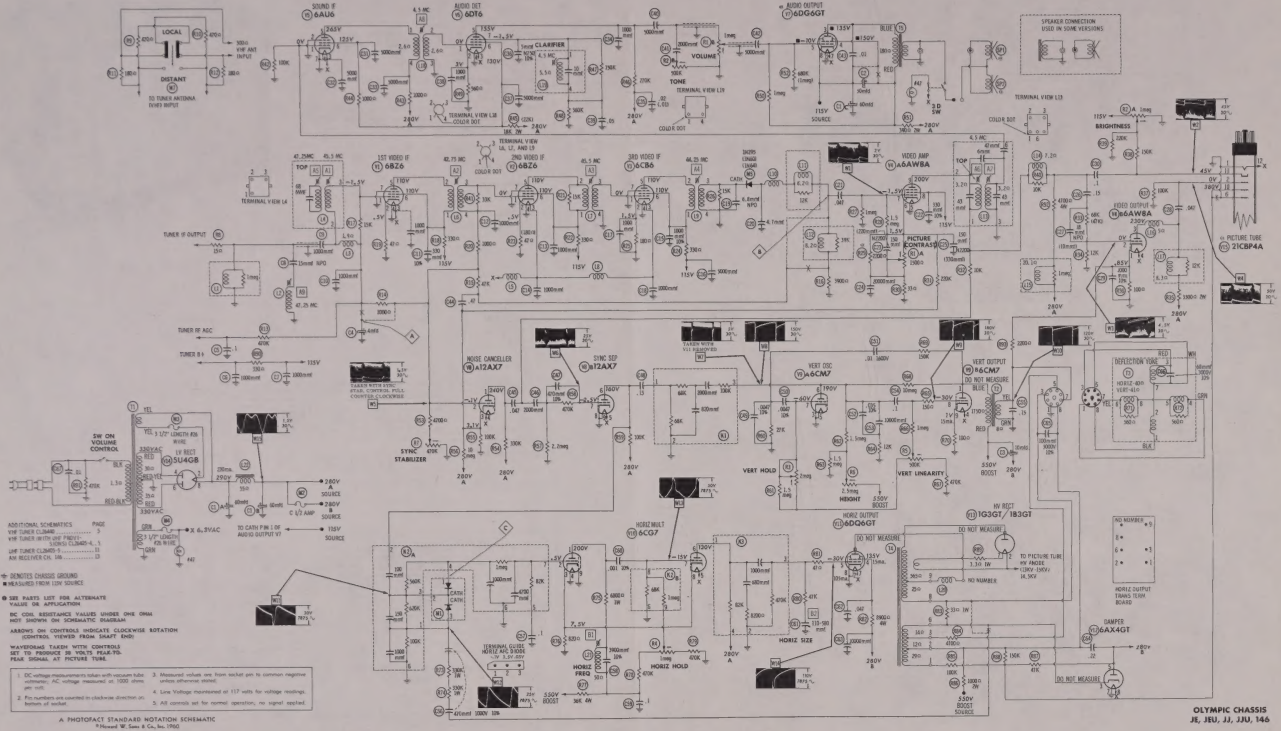
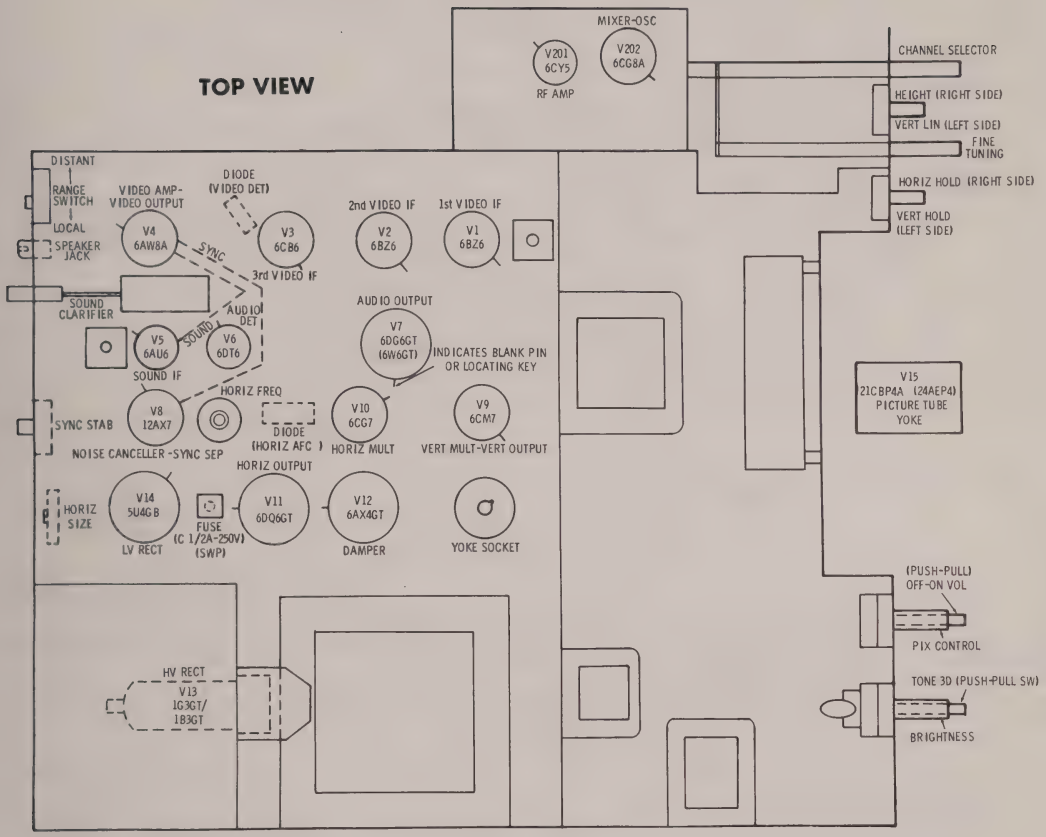
JA643


OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1960

TUBE PLACEMENT CHART



OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse Wire (Fil.), Fuse Wire (LV Power), V14

SWEEP FAILURE
No raster, has sound V10, V11, V12, V13, V15, Fuse (Swp.)
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V10, V11
Narrow picture V10, V11, V12, V14
Vert. off freq. V9
Horiz. off freq. Diode (Horiz. AFC), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, Diode (Horiz. AFC)
No vert. or horiz. sync V8

FOLDER 1

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:
Mixer Plate Coil, 47.25MC Trap on Tuner, and A1 thru A7 .....GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A8 .....GENERAL CEMENT #8721, 8722
WALSCO #2519

VIDEO IF ALIGNMENT

Preset A1 and A5 for maximum core separation.
Connect the negative lead of a 4 volt bias supply to point (A). Positive to chassis..
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis.	Not used	44.5MC (Unmod.)	Any non-interfering channel	Use VTVM DC probe thru 100K to point (B). Common to chassis. (Across Video Det. load.)	Mixer Plate Coil	Use only enough generator output to provide a usable indication. Adjust for maximum deflection.
2.	"	"	"	45.5MC	"	"	A1	"
3.	"	"	"	42.75MC	"	"	A2	"
4.	"	"	"	45.5MC	"	"	A3	"
5.	"	"	"	44.25MC	"	"	A4	"
6.	"	"	"	47.25MC	"	"	A5 and 47.25MC Trap on Tuner	Adjust for MINIMUM deflection.
7.	"	"	44.5MC (10MC Swp.)	41.25MC 42.5MC 45.75MC 47.25MC	"	Use SCOPE. Vert. Amp. thru 100K to point (B). Low side to chassis. (Across Video Det. load.)		Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A1 thru A5 and Mixer Plate Coil to obtain desired response.

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.
Remove 3rd Video IF tube from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru diode probe (Fig. 2) to pin 11 (cathode) of picture tube. Common to chassis.	A6	Use maximum generator output. Adjust A6 for MINIMUM deflection. Replace 3rd Video IF tube in its socket.

SOUND IF ALIGNMENT

Tune in a TV Station and set controls for normal operation. Connect an Output meter across the speaker voice coil.
Adjust A7 and A8 for maximum deflection. Adjust Sound Clarifier for maximum deflection, then for maximum undistorted sound.

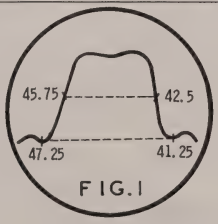


FIG. 1

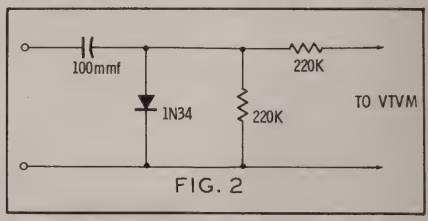


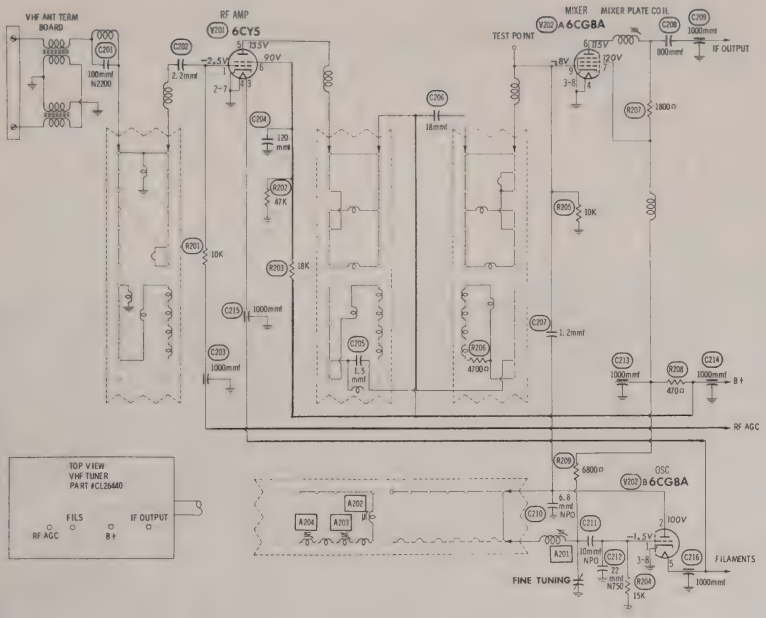
FIG. 2

RADIO ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Conv. Low side to chassis.	455KC (400% Mod.)	AM Tuning Gang	Across voice coil of either speaker	A9, A10, A11, A12	Adjust for maximum output.
2.	Loop	1500KC	1500KC	"	A13	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	"	"	"	A14	Adjust for maximum output while rocking tuning gang.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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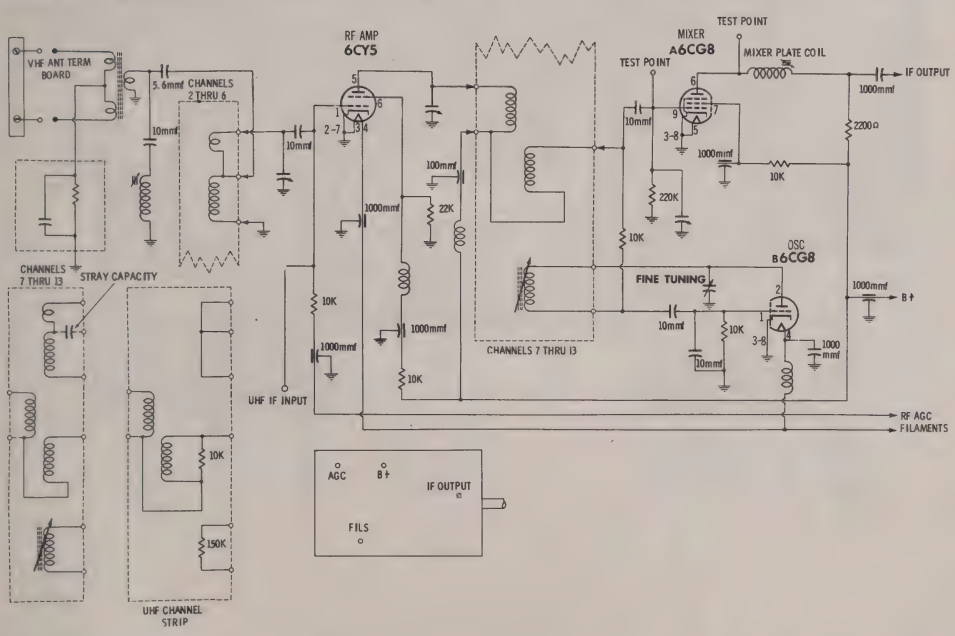
VHF TUNER CL26440



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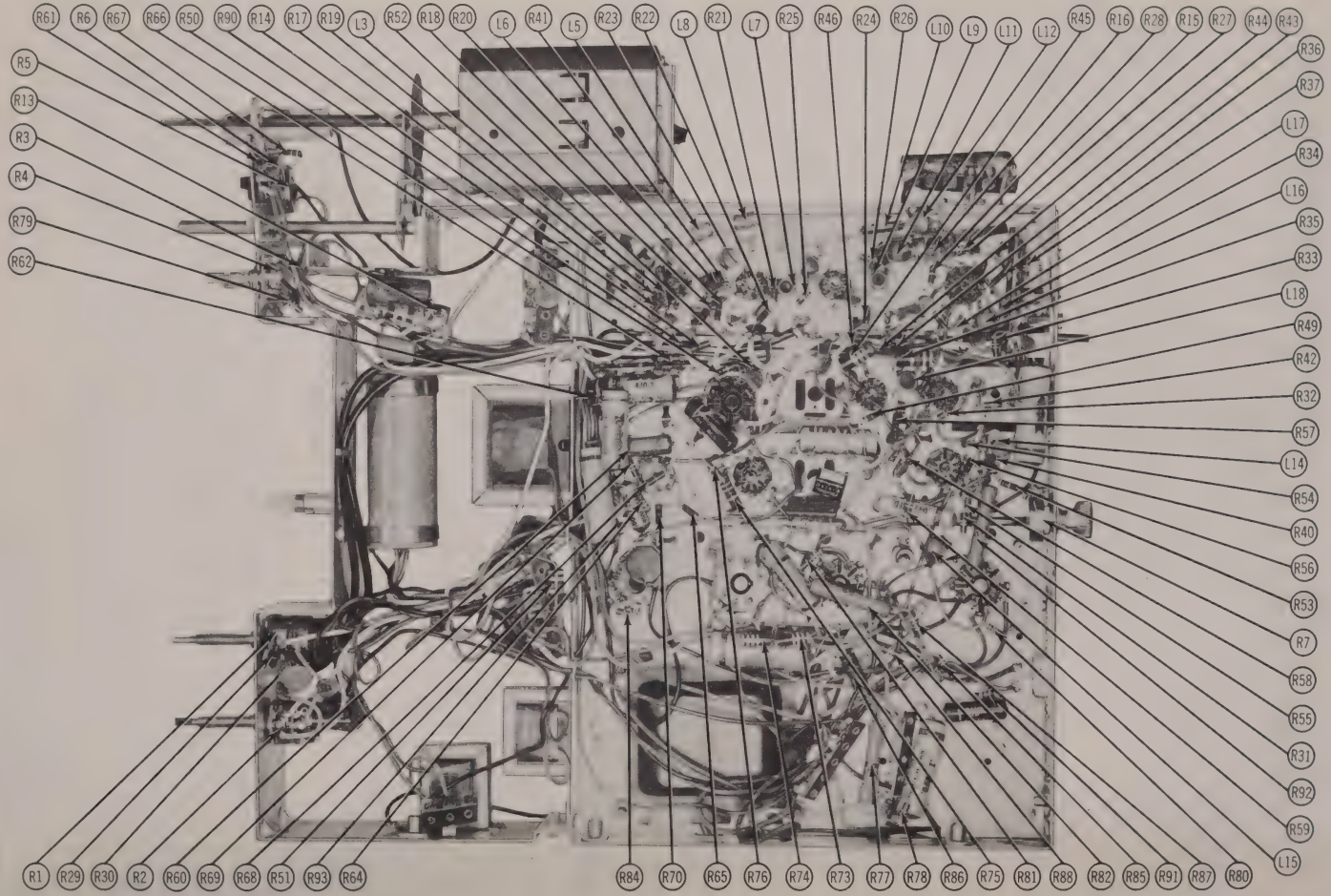
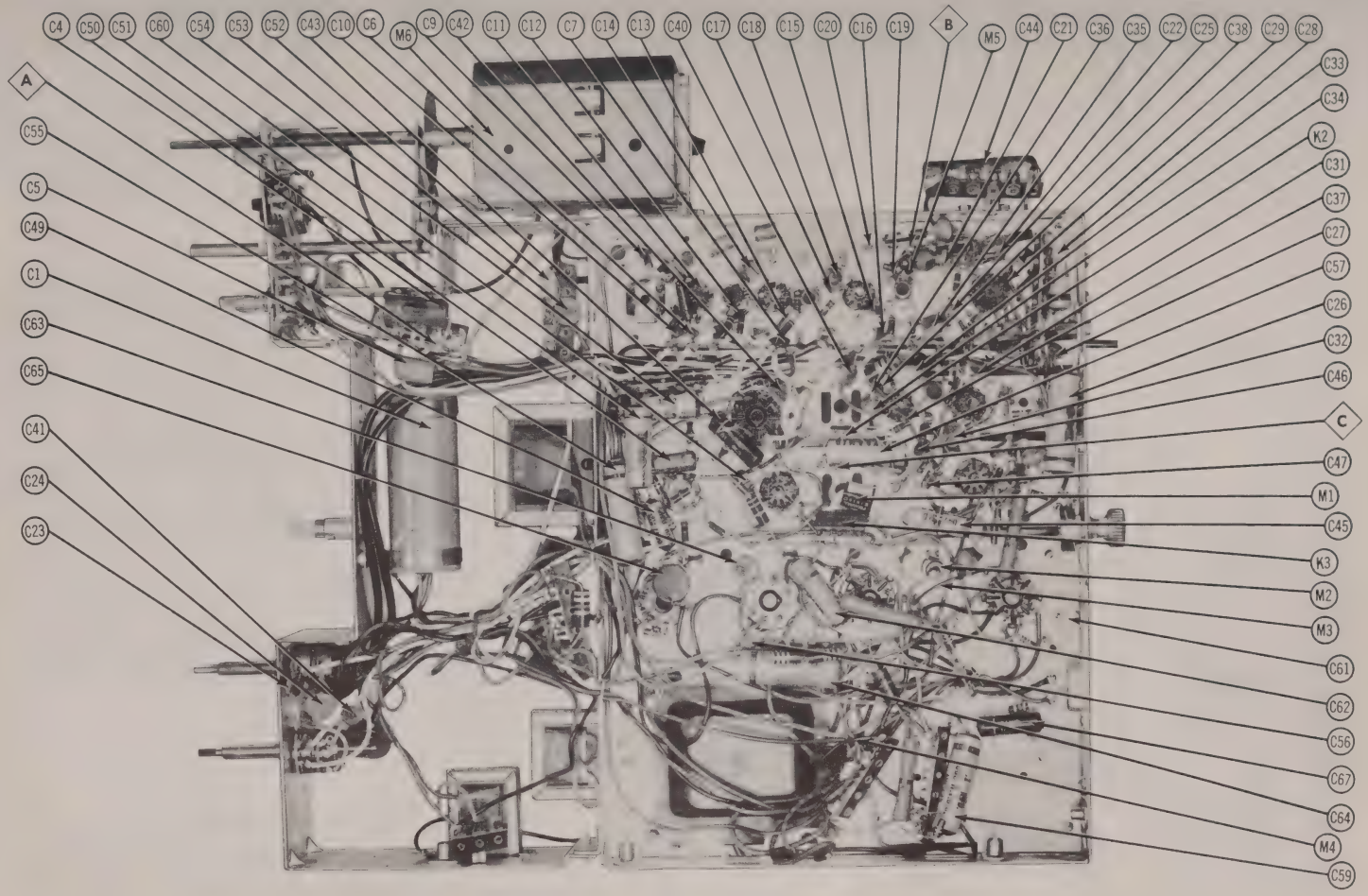
VHF TUNER with UHF Provisions - CL26405-4



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

FOLDER 1

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA
	USE / TYPE	USE / TYPE	USE / TYPE	USE / TYPE
V1	1st Video IF Amp. / 6BZ6		V8 Noise Canceller-Sync Sep. / 12AX7	
V2	2nd Video IF Amp. / 6BZ6		V9 Vert. Mult. - Vert. Output / 6CM7	
V3	3rd Video IF Amp / 6CB6		V10 Horiz. Mult. / 6CG7	
V4	Video Amp - Video Output / 6AW8A		V11 Horiz. Output / 6DQ6GT	
V5	Sound IF Amp. / 6AU6		V12 Damper / 6AX4GT	
V6	Ratio Det. / 6CY5		V13 HV Rect. / 1G3GT/1B3GT	
V7	Audio Output / 6DG6GT (6V6GT) *		V14 LV Rect. / 5U4GB	

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	OLYMPIC PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V10	RCA- M4AP94	RCA- M4AP94	1 2CP4-A M4AP94	2 RCA- M4AP94	3 RCA- M4AP94	1 Aluminized 2 Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING			REPLACEMENT DATA				NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1A	80	350	CO-35794	PRA-450	-SRBT0283 -SRB0835	WT456		TVA8-3626 *
B	80	350						
C	60	300						
C2	50	350	CO-3064-3	PRS2345	BR5035	TC59	TD-50-450	TVA-1713
C9	10	450	CO-4033-2	PRS1730	BR1045	TC72	TD-10-450	TVA-1708
C4	4	50	CO-3754	PRS1400	BR84-50	TC5034	TD-4-50	TVA-1603

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in mfd. Resistance values are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				CBS PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	EUMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	1000	400V		PA88M-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C5	1000			BPD-001	BPD-001	BYA10D1	CCD-102	GP120	5HK-D10
C7	1000			BPD-001	BPD-003	BYA10D1	CCD-103	GP120	5HK-D10
C8	15	MPO		WPO-DU-15	DTS-15	CDQ2C	CTO-150	CMO-150	10TCC-Q15
C9	1000			BPD-001	BPD-001	BYA10DX	CCD-102	GP120	5HK-D10
C10	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C11	330	10%		IE-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C12	1000			BPD-001	BPD-001	BYA10DX	CCD-102	GP120	5HK-D10
C13	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C14	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C15	1000	10%		DL-1000	DD-103	PM81DX	CCD-103	GP120	10TS-D10
C16	5000			BPD-002	BPD-003	BYA10DX	CCD-503	GP150	5HK-D50
C17	5000			BPD-005	BPD-003	BYA10DX	CCD-503	GP150	5HK-D50
C18	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C19	15	MPO		WPO-DU-15 & 8	DTS-15&8	CDQ2C	CTO-158&8	CMO-158	10TCC-V15&
C20	6.8			HPO-SU-6.8	TCZ-6R8	CUV4TC	CCTO-6R7	CMO-667	10TCC-V6R
C21	1000	400V		PA88M-04F1	DF-103	CUB4P1	4DP-3-473	GEM-4147	4TM-S47
C22	330	10%		DL-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C23	150	MZ20	(330mmf) †				*		30TCV-T15
C24	20000			BPD-03	DD-203	BYD6E3	CCD-203	GP120	5HK-X20
C25	150	MZ20	(330mmf) †				*		30TCV-T15
C28	.15	600V		PA88M-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C27	18	MPO	(10mmf) †		TCS-18	CDQ2C	CTO-180	CMO-418	10TCC-Q18
C28	.047	400V		PA88M-047	DD-503	CUB4M7	4DP-3-473	GEM-4147	4TM-S47
C29	1000	10%		DL-1000	DD-103	PM81DX	CCD-103	GP120	10TS-D10
C30	.1	600V		PA88M-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C31	5000			BPD-005	BPD-003	BYA10DX	CCD-503	GP150	5HK-D50
C32	5000			BPD-005	BPD-003	BYA10DX	CCD-502	GP150	5HK-D50
C33	5000			BPD-005	BPD-003	BYA10DX	CCD-503	GP150	5HK-D50
C34	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C35	9	500V	(.0mfd) †	PA88M-03	DD-303	CUB4E3	4DP-3-303	GEM-413	4TM-S3
C36	5	MY50	10%	DTM-5		CUV5U	CCTH-050	CMT-550	10TCC-V50
C37	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C38	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C39	.05	50V		PA88M-05	DDA-503	CUB3E5	1DP-5-503	GEM-415	2TM-S5
C40	1000			BPD-001	BPD-003	BYA10DX	CCD-103	GP120	5HK-D10
C41	3300			BPD-002	BPD-302	BYA10D3	CCD-302	GP120	5HK-D30
C42	5000			BPD-005	BPD-003	BYA10DX	CCD-503	GP150	5HK-D50
C43	.01	600V		PA88M-01	DB-103	CUB3E1	8DP-3-103	GEM-411	8TM-S1
C44	.047	600V		PA88M-47		CUB4P47	4DP-5-447	GEM-4147	4TM-P47
C45	.047	600V		PA88M-047	DD-503	CUB4M7	4DP-3-473	GEM-4147	4TM-S47
C46	5000			BPD-005	BPD-003	BYA10DX	CCD-502	GP120	5HK-D50
C47	470	10%		DL-470	DB-471	SBT747	CCD-471	GP747	10TS-T47
C48	.15	600V		PA88M-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C49	.0047	600V	10%	194C5D47-10P5		PM8D47	6DP-1-473	GEM-4547	6TM-D47
C50	.0047	600V	10%	194C5D47-10P5		PM8D47	6DP-1-473	GEM-4547	6TM-D47
C51	.01	1600V		PS84CM-01	DCS6-103	CUS5E1	16DP-3-103	GEM-4611	MS-2E
C52	.0068	600V	10%	194C5C-6S9			6DP-3-683		6TM-S2S
C53	10000			BPD-01	BD-103	BYA10E	CCD-102	GP120	5HK-E20
C54	.1	600V		PA88M-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C55	.15	600V		PA88M-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C56	470	600V	10%	DL-470	DD-471		CCD-471	GP747	10TS-T47
C57	.1	600V		PA88M-1	DF-104	CUB3P1	3DP-3-104	GEM-301	3TM-P1
C58	2000	10%		194-0003		UBJD21	CM-20B-202K	MC1462.5	MS-2D
C59	.1	600V		PA88M-1	DF-104	CUB4P1	4DP-4-104	GEM-401	4TM-P1
C60	.022	600V	10%	194C6K-10P5	DD-203	PM8E3	6DP-1-102	GEM-1612	6TM-D1
C61	10-580		#CT3538				467		135th
C62	.047	400V		PA88M-047	DD-503	CUB4M7	4DP-3-473	GEM-4147	4TM-S47
C63	10000			BPD-01	DD-103	BYA10E	CCD-103	GP110	5HK-E10
C64	.22	400V		PA88M-22		CUB4P22	4DP-5-236	GEM-4022	4TM-P22
C65	100	3000V	10%	#CS3701				3DY-100	
C66	68	3000V	10%	#CO4520				3DY-685	
C67	.01	600V		PA88M-01	DB-103	CUB3E1	8DP-3-103	GEM-411	8TM-S1

† Alternate Values. # Olympic Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST. OHMS	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1500Ω		PT28560					Picture (Contrast)
B	linear				RTV-696		* CE228-S	Volume
C	Switch							Power Off-On
R2A	linear		PT28738					Brightness
B	500K							Tone
C	Switch							2D Off-On
R3A	2meg		PT28439	B-7S	A4T-2meg-S	Q2L-159	U56	Vert. Hold
B	Shaft			Not Req.	82B-2	Not Req.	Not Req.	
R4A	1meg		PT28439	B-6S	A4T-1meg-S	Q2L-137	U54	Horiz. Hold
B	Shaft			Not Req.	82B-2	Not Req.	Not Req.	
R5A	500K		PT28790	B-5S	B4T-500K-S	S1L-133	PTA55L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	
R6A	2.5meg		PT30081	A8-4S	A2T-2.5meg-S	S1L-259	TA25L	Height
B	Shaft			A8-1	Not Req.	TM4	Not Req.	
R7	470K		PT28565	B-6S		Q2T-153		Sync Stability

* "ITA-LOC" equivalent: FA18SR, RUP18A, OS850.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	15Ω	
R9	470Ω	
R10	470Ω	
R11	100Ω	
R12	180Ω	
R13	470K	
R14	1000Ω	
R15	47K	
R16	1900Ω	
R17	15K	
R18	330Ω	
R19	470	
R20	1000Ω	
R21	100Ω	
R22	330Ω	
R23	470	(180Ω) *
R24	330Ω	
R25	180Ω	
R26	15K	
R27	1.5meg	
R28	1.5meg	Note 1
R29	2200Ω	
R30	330	
R31	330Ω	
R32	68K	(47K) *
R34	12K	
R35	3300Ω 2W	
R36	100Ω	

ITEM No.	RATING	REMARKS
R37	100K	
R38	150K	
R39	220K	
R40	10K	
R41	33K	
R42	100K	
R43	1000Ω	
R44	1000Ω	
R45	18K 2W	(22K) *
R46	270K	
R47	150K	
R48	560K	
R49	560Ω	
R50	1meg	
R51	390Ω 2W	
R52	680K	(1meg) *
R53	4700Ω	
R54	330K	
R55	100K	
R56	10meg	
R57	2.5meg	
R58	470K	
R59	10K	
R60	27K	
R61	1.5meg	
R62	1.5meg	
R63	1.5meg	
R64	12K	
R65	150Ω	

ITEM No.	RATING	REMARKS
R66	1meg	
R67	470K	
R68	10meg	
R69	150K	
R70	100Ω	
R71	560Ω	
R72	560Ω	
R73	330K 1W	
R74	330K 1W	
R75	6800Ω 1W	
R76	820Ω	
R77	3K 4W	#RE28300
R78	470K	
R79	470K	
R80	47K	
R81	47Ω	
R82	6800Ω 4W	#RE28574
R83	330 1W	
R84	4700Ω	
R85	100K	
R86	2000Ω 2W	
R87	47K	
R88	150K	
R89	3.3Ω 1W	
R90	330Ω	
R91	470K	
R92	4700Ω 4W	
R93	2200Ω	

Note 1. May not be used in some versions. * Alternate. # Olympic Part Number.

COMPONENT COMBINATIONS

ITEM No.	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA
K1	Vert. Integrator	820mmf, 2000mmf, 68K, 68K, 100K	PC36048
K2	Horiz. AFC and Horiz. Mult. Grid Network	100mmf, 150mmf, 1000mmf, 1000mmf, 4700mmf, 68K, 82K, 100K, 560K, 820K, 1meg, 1meg	PC35758
K3	Horiz. Mult. Plate	680mmf, 1000mmf, 8200Ω, 82K, 470K	PC35714

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke	CL-2476						①
L2	47.25MC Trap	CL-2643						15th
L3	Resonant Choke	CL-2641						
L4A	1st Video IF	CL-2618					6233 †	
B	47.25MC Trap							
L5	Fil. Choke	CL-2437		19-1001	19-1001	BC-562	4604	1.4uh
L6	2nd Video IF	CL-2511		17-4532	17-4532	TV-130	6319	VF-3
L7	3rd Video IF	CL-2611		17-4533	17-4533	TV-130	6319	VF-3
L8	Fil. Choke	CL-2437		19-1001	19-1001	BC-562	4604	1.4uh
L9	4th Video IF	CL-2611		17-4533	17-4533	TV-130	6319	VF-3
L10	Resonant Choke	CL-2643						6.8uh
L11	Series Peaking Coil	CL-2569		19-3180 *	19-1484 *	TV-184 *	6180 *	VP-5 * 180uh
L12	Shunt Peaking Coil	CL-2577		19-4180	19-4180	TV-183	6179	VP-5 a 180uh
L13A	Sound IF	CS-3146-1						
B	4.5MC Trap							
L24	Series Peaking Coil	CL-2578		19-3150	19-3150	TV-185	6181	VP-6 340uh
L25	Shunt Peaking Coil	CL-2646				TV-306 a	6148 a	750uh
L26	Series Peaking Coil	CL-2579		19-3125	19-3125			135uh
L27	Shunt Peaking Coil	CL-2558		19-3180 *	19-3180 *	TV-184 *	6180 *	VP-5 * 180uh
L28	Sound IF	CL-2706						
L19	Quadrature Coil	CL-2603-1						SD-5
L20	Resonant Choke	CS-2415						6.8uh

† Disregard Secondary Winding
* Parallel with 12K Resistor.
a Parallel with 39K Resistor.
= Parallel with 1meg Resistor.

① 4 Turns Wire on 1meg Resistor.
② Wound on 12K Resistor.
③ Wound on 39K Resistor.
④ Wound on 1meg Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L21	50Ω		CL5464-1						Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 Cy.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L22	230A	55Ω	.6 Hy.	CK4047					C-3237 ①	C-36X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.45A	660VCT @ .230A	5V @ 3A	TR28192	36R94 ①					36R94 ① R-66BC
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2A									

① Tape 2.5A (6.3V) winding, phase and parallel 5A (6.3V) windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	TR-28791-3								A-16LX
T3	Yoke-Horiz. (68MH) (90°) - Vert. (39MH)	CL-2600-4	Y-18 ①	MDF-92 ① ③	Y90T9/4R ① ③	PCM2045 ① ②	DY-18A ① ②	Y-18 ①	Y-41 & YW-3 & YC-1 & CL-1	
T4	Rear Cover and Centering Device Yoke Clamp	RP-5640								
	Horiz. Output	RP-5672								
		TR-3596-5	FLY-143 *	RVO-131 * ④	RO51 *	FFR65 * ④	HO-296 *	FLY-143 *	D-130 *	

① Connect same as original. ② Use original Horiz. Yoke Damping Network if necessary.
③ Drill new mounting hole(s).

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
9	4	8	9	5	4	4	9
8	8	6	8	4	8	8	8
6	7	6	6	4	7	7	6
3	2	5	4	3	2	2	2
2	5	4	3 & 2	2	3	5	2
1	1	3	1	1	1	1	1
Special Notes ②	①	①	①	①	④	①	①

② Filament requires two turns.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	2500Ω	3-4Ω	TR5367				A-3876 ①		S-8LX ①	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.		OLYMPIC PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω		SK3788-2 *	5A07	* Used in Model TE302
SP2	2½"	PM	3-4Ω		SK3545 *	3A15T	† Two used in Models CE308, CE309, CJ442, KE220
	4"	PM	3-4Ω		SK4542 *	4A07M	‡ Used in Models CE308, CE309, CJ442
	6"	PM	3-4Ω		SK36164 †	6A1	† Two used in Model KE220.
	6" x 9"	PM			SK3788 †		

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	OLYMPIC PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		RF5465 *	1T1 †	K1615 *			*Dual Selenium Diode †Single Selenium Diode (Two required)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	C	½A	FU26203	FH4344	332.500 (C ½A 250V)	346002	C ½	HC 3/10 to ½
M3	3½" length of #26 wire							
M4	3½" length of #26 wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5	1N295 *		1N60	1N295	1N295	Video Detector (Pigtail) * 1N60, 1N64 Alternates

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M6	Tuner	CL26726	VHF
	Tuner	CL26440	VHF
		CL26405-4	VHF with UHF Provisions
	Tuner	CL26405	VHF-UHF Tuner
		CL26405-5	UHF
M7	Switch	SW2966-1	Local-Distant (DPDT Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	PP3646-2	Models CE208, CE209, KE220, TE202
Mask	PP3938	Model CJ442
Safety Glass	PP3656-1	Models CE208, CE209, KE220, TE202
Safety Glass	PP3939-1	Model CJ442
Knob	KN26264	Channel Selector
Knob	KN26671	Fine Tuning
Knob	KN26491	Radio Tuning, Model KE220
Knob	KN26265	Dial
Knob	KN25773	Brightness, Contrast
Knob	KN26271	Vertical Hold
Knob	KN26272	Horizontal Hold
Knob	KN26273	Off-On
Knob	KN26318	Loudness (Rear), Model KE220
Knob	KN26487	Balance Loudness (Front), Model KE220
Knob	KN26485	Channel A Bass (Front), Model KE220
Knob	KN26490	Channel B Bass (Rear), Model KE220
Knob	KN26486	Channel A Treble, Off (Front), Model KE220
Knob	KN26489	Channel B Treble, (Rear), Model KE220
Knob	KN26493	Function Selector, Model KE220
Knob	KN25776	3D Tone

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-In	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER
CL-26440
PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6CY5	V202	Mixer-Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	100 N2200					*		30TCY-T10
C202	2.2		NPO-DI 2.2	DTZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	120		DI-120	DD-121	L10T12	CCD-121	GP312	10TS-T12
C205	1.5		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C206	18		DI-18	DD-180	L10Q18	CCD-180	GP418	10TS-Q18
C207	1.2		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V12
C208	800		BPD-0008	DD-801	L10T8	CCD-821	GP382	10TS-T80
C209	1000		EF-001	MFT-1000		CCF-102	CT280A	
C210	6.8 NPO		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C211	10 NPO		NPO-DI 10	DTZ-10	C10V10C	CCTO-100	CNO-410	10TCC-Q10
C212	22 N750		N750-SI 22	TCN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	10K	
R202	47K	
R203	18K	

ITEM No.	RATING	REMARKS
R204	15K	
R205	10K	
R206	4700Ω	

ITEM No.	RATING	REMARKS
R207	1800Ω	
R208	470Ω	
R209	6800Ω	

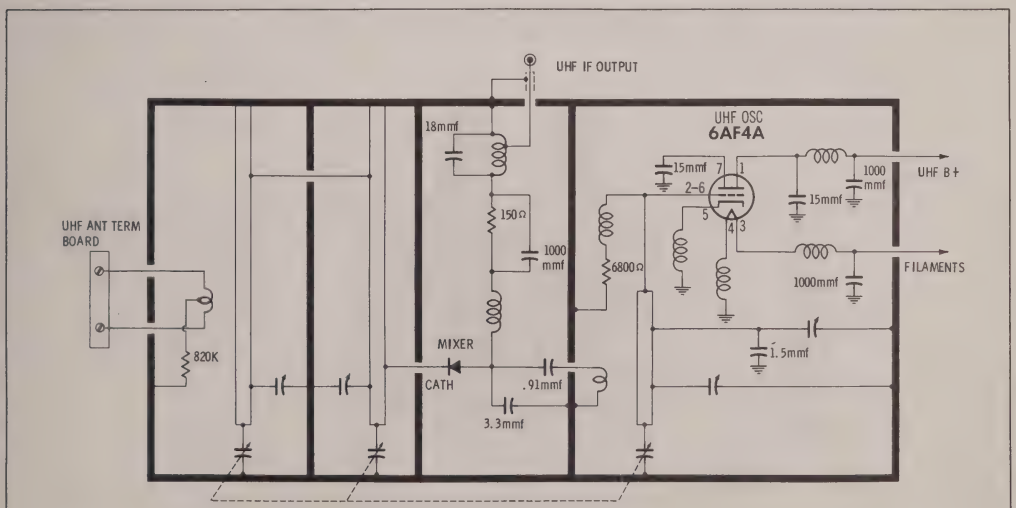
ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

Set the Fine Tuning to the center of its range. Set the Channel Selector to the highest high band channel operating in the area. Adjust A201 for best picture and sound. Check all other high band channels operating in the area in a descending order and if necessary, adjust the coil for that channel by bending toward or away from the wafer for best picture and sound.
Set the Channel Selector to the highest low band channel operating in the area and adjust the appropriate slug for best picture and sound. A202 is the adjustment for both channel 6 and 5. However, the slug can only be reached when the Selector is set to channel 6. Therefore, to adjust channel 5 switch to channel 6, adjust slug then switch back to channel 5 and check picture. Repeat until adjustment is satisfactory. A203 is for adjusting channels 4 and 3 and is adjusted in the same manner switching to channel 4 to adjust channel 3. A204 is for adjusting channel 2.

RF AND MIXER ALIGNMENT

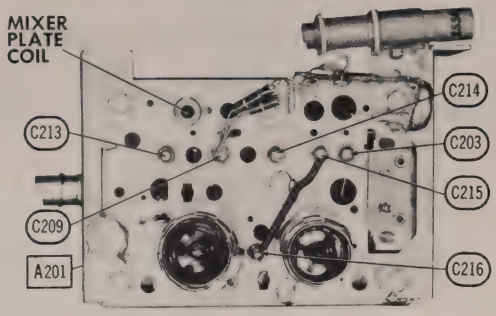
This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attemped in the field.



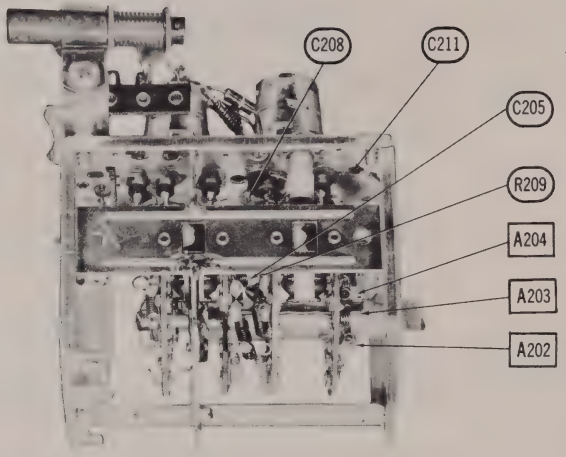
UHF TUNER CL26405-5

OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

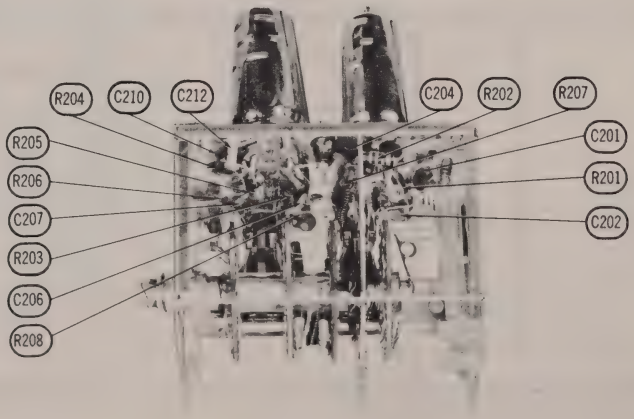
FOLDER 1



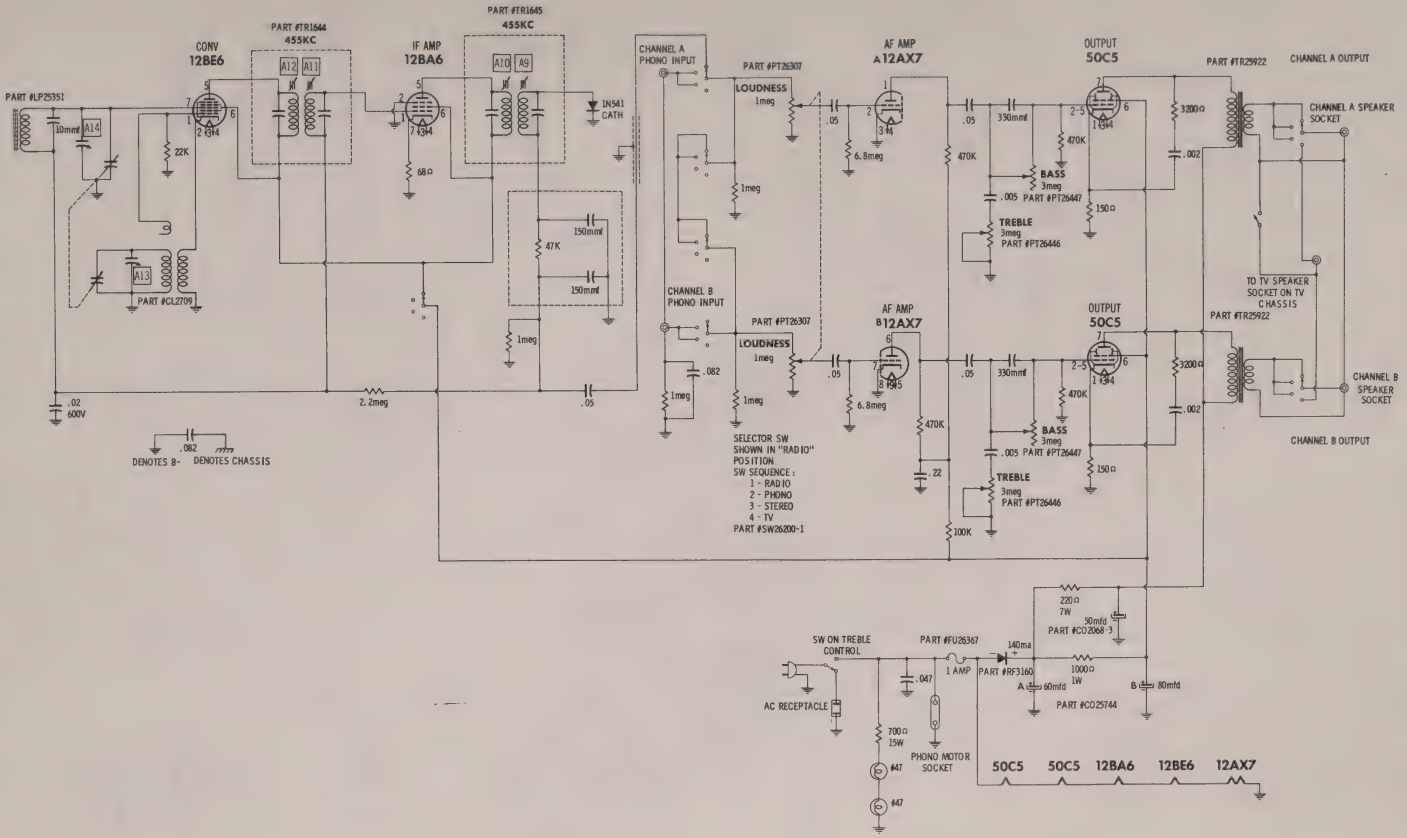
VHF TUNER CL26440 - TOP VIEW



VHF TUNER CL26440 - LEFT SIDE



VHF TUNER CL26440 - RIGHT SIDE



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AM RECEIVER CHASSIS 146

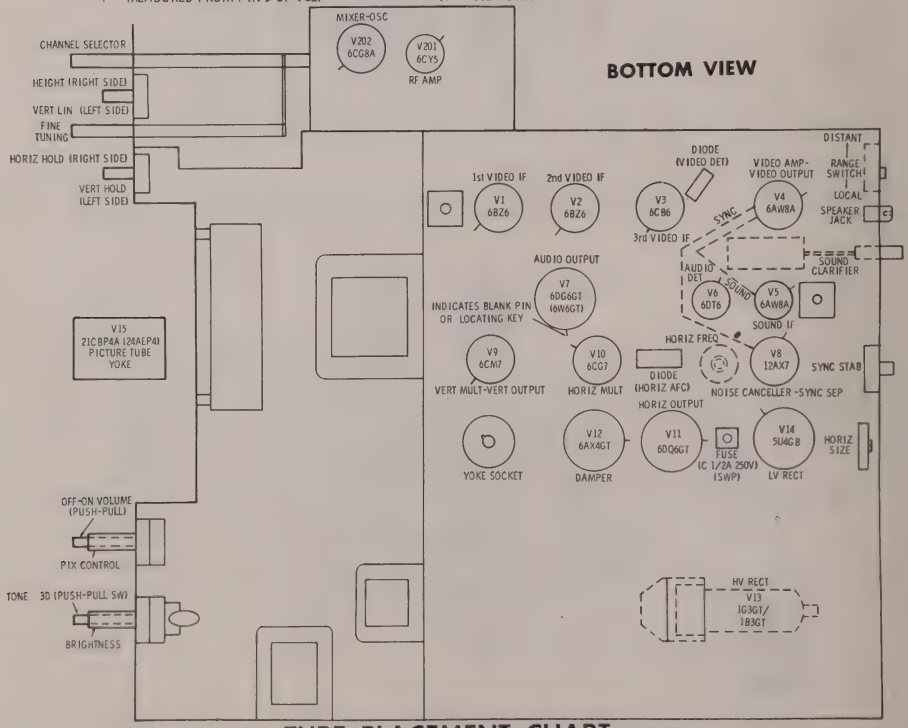
OLYMPIC CHASSIS
JE, JEU, JJ, JJU, 146

FOLDER 1

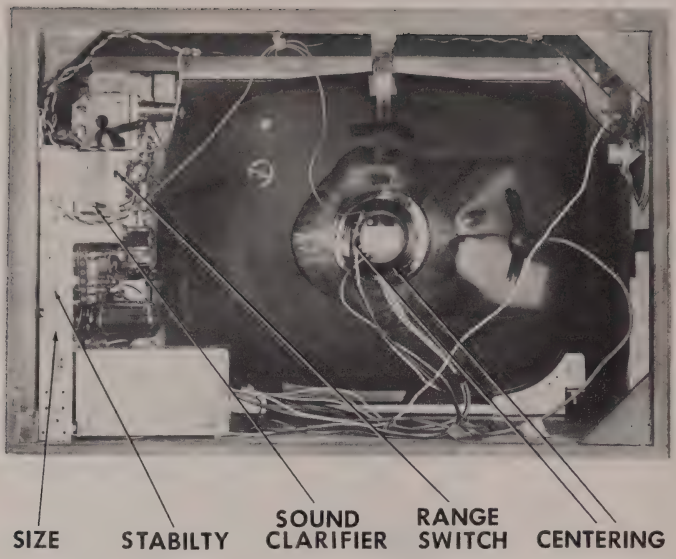
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	• 18K	47Ω	.1Ω	0Ω	▪ 330Ω	▪ 330Ω	0Ω		
V2	6BZ6	• 18K	47Ω	.1Ω	0Ω	▪ 330Ω	▪ 330Ω	0Ω		
V3	6CB6	.5Ω	180Ω	.1Ω	0Ω	▪ 330Ω	▪ 330Ω	0Ω		
V4	6AW8A	100Ω	12K	† 3300Ω	.1Ω	0Ω	• 350Ω	650K	▪ 0Ω	† 4700Ω
V5	6AU6	100K	0Ω	.1Ω	0Ω	† 1000Ω	† 19K	0Ω		
V6	6DT6	2.6Ω	560Ω	.1Ω	0Ω	† 270K	† 18K	560K		
V7	6DG6GT	0Ω	0Ω	† 570Ω	† 390Ω	300K	TP	.1Ω	¶	
V8	12AX7	† 330K	• 18K	90K	.1Ω	.1Ω	† 100K	2.7meg	0Ω	0Ω
V9	6CM7	† 2750Ω	NC	0Ω	.1Ω	0Ω	† 1.6meg	• 1.5meg	• 1.2meg	100Ω
V10	6CG7	† 45K	2.3meg	820Ω	0Ω	.1Ω	† 82K	68K	820Ω	0Ω
V11	6DQ6	0Ω	0Ω	NC	† 8900Ω	470K	TP	.1Ω	0Ω	TOP CAP 58Ω
V12	6AX4GT	NC	NC	¶ 1meg	NC	† 0Ω	NC	0Ω	.1Ω	
V13	1G3GT 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 625Ω
V14	5U4GB	NC	¶	NC	30Ω	TP	35Ω	TP	¶	
V15	21CBP4A	0Ω	100K	Pin 6 † 100K	Pin 10 † 100K	Pin 11 • 280K	Pin 12 .1Ω			
V201	6CY5	• 490K	0Ω	.1Ω	0Ω	▪ 330Ω	▪ 18K	0Ω		
V202	6CG8A	15K	▪ 7600Ω	0Ω	0Ω	.1Ω	▪ 2500Ω	▪ 700Ω	0Ω	10K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 115V SOURCE.
† MEASURED FROM 280V SOURCE.
+ MEASURED FROM PIN 3 OF V12.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and allow it to warm up for 2 minutes.

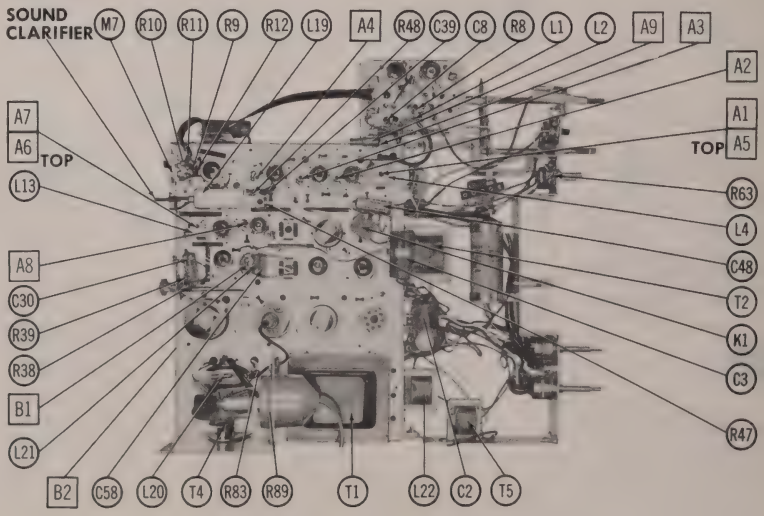
Tune in a TV station, preferably with a test pattern.

Connect a clip lead from point ◇ to chassis. Connect another clip lead across the Horizontal Stabilizer coil (L21).

Adjust the Horizontal Hold until the picture synchronizes horizontally. (It may float back and forth.)

Remove the clip lead from L21. Adjust the Horizontal Frequency slug (B1) until the picture is again in frequency. Remove clip lead from point ◇ and chassis. Turn Horizontal Size Trimmer (B2) counterclockwise until a vertical white line (drive line) appears near the center of the screen, then turn clockwise until line just disappears. If drive line cannot be obtained, adjust B2 for proper width.

If B2 is adjusted, recheck adjustment of B1 and Horizontal Hold.



CHASSIS—TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

MODEL 120-5 (Ch. 528.50343)

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

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SET 486 FOLDER 2

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 120-5 (CH. 528.50343)

1. Remove 9 wood and 1 metal screw holding rear cover. Remove Tuner antenna leads. Remove rear cover.
2. Remove 8 push-on type knobs from front of cabinet.
3. Remove yoke plug, speaker leads, hi voltage lead, and picture tube socket.
4. Remove 2 wood screws holding AC interlock bracket.
5. Remove 2 nuts holding bottom chassis bracket.
6. Remove 2 wood screws holding top chassis brackets and 1 screw holding Tuner mounting bracket.
7. Remove chassis.

PICTURE TUBE REMOVAL

1. Follow steps 1 and 2 of chassis removal.
2. Remove yoke plug, hi voltage lead, and picture tube socket.
3. Remove 2 wood screws at bottom front of front mask. Lower mask and remove.
4. Remove 4 picture tube mounting bracket bolts.
5. Remove picture tube out front of cabinet.

MODEL 120-5 (Ch. 528.50343)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	Silvertone	Models	Chassis
		PC-100, PC-101, PC-102BE, PC-102GY, PC-103, PC-110, PC-120	456.50340, 456.50342
		PC-100-5, PC-101-5, PC-102-5BE, PC-102-5GY, PC-103-5, PC-110-5, PC-120-5	456.50341, 456.50343
		100, 101, 102BE, 102GY, 103, 110, 120	528.50340, 528.50342
		100-5, 101-5, 102-5BE, 102-5GY, 103-5, 110-5, 120-5	528.50341, 528.50343
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Avenue, Chicago, Illinois		
TYPE SET	Television Receiver		
TUBES	VHF - Fourteen, UHF - Fifteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 145 Watts, 1.3 Amp. @ 117 Volts AC		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 wood screws at bottom front of mask. Lower mask and remove.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart.")

TUNER OSCILLATOR ADJUSTMENTS

To touch up VHF Oscillator, it is necessary to remove rear cover.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by connecting the lead from pin 6 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency Slug (B1).

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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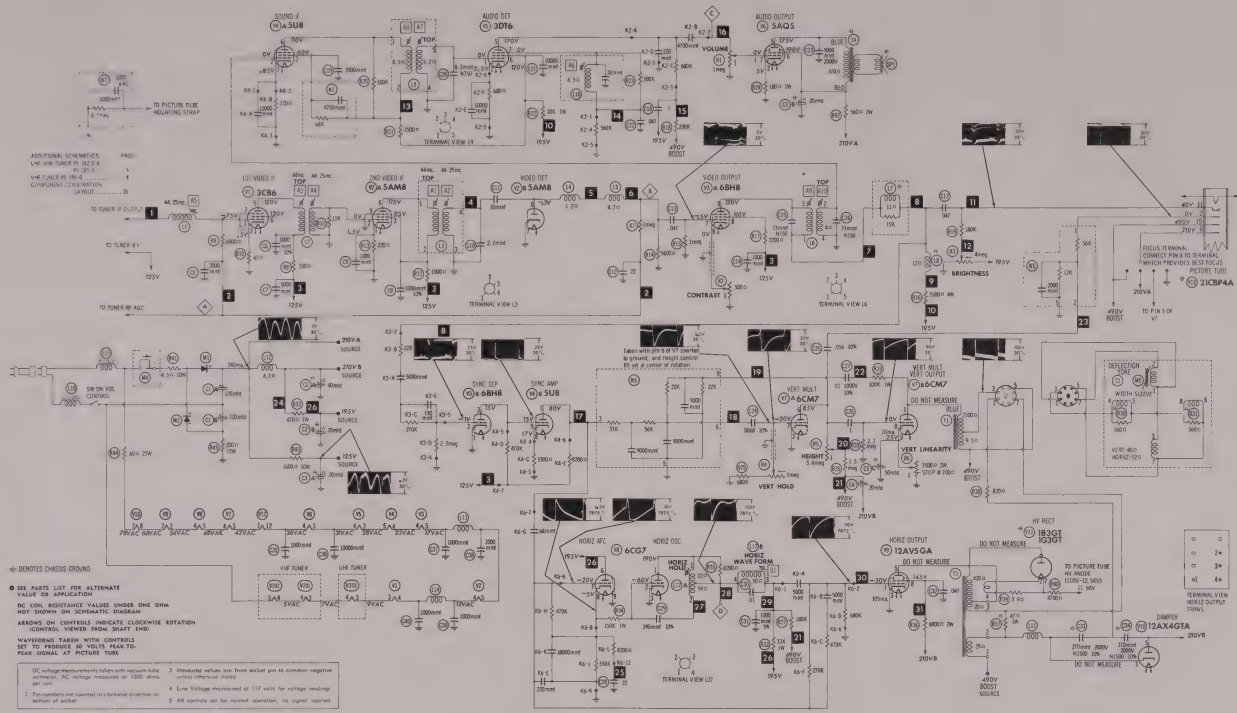
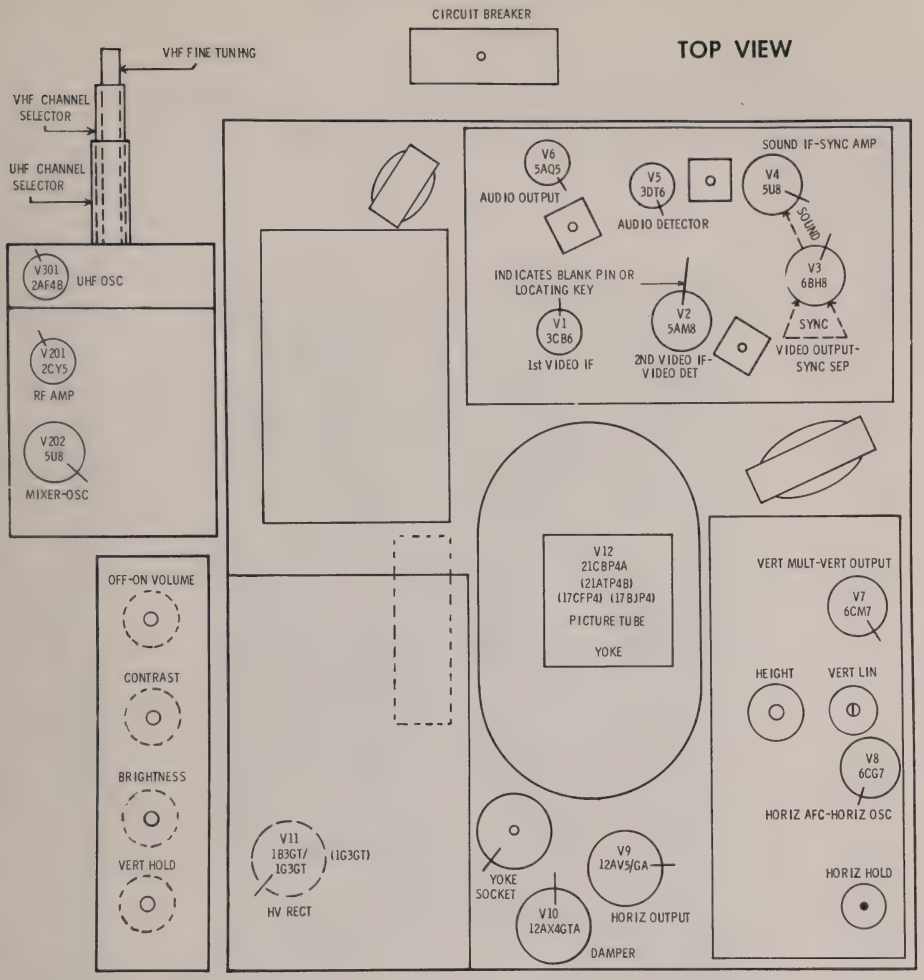


SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

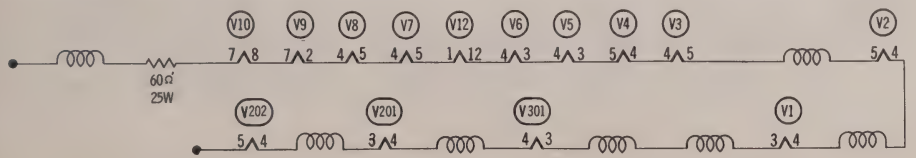
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Rectifiers (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, Rectifiers (B+)
Vert. off freq. V7
Horiz. off freq. V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5, V6

SYNC FAILURE
No vert. sync V3, V4
No horiz. sync V3, V4
No vert. or horiz. sync V3, V4

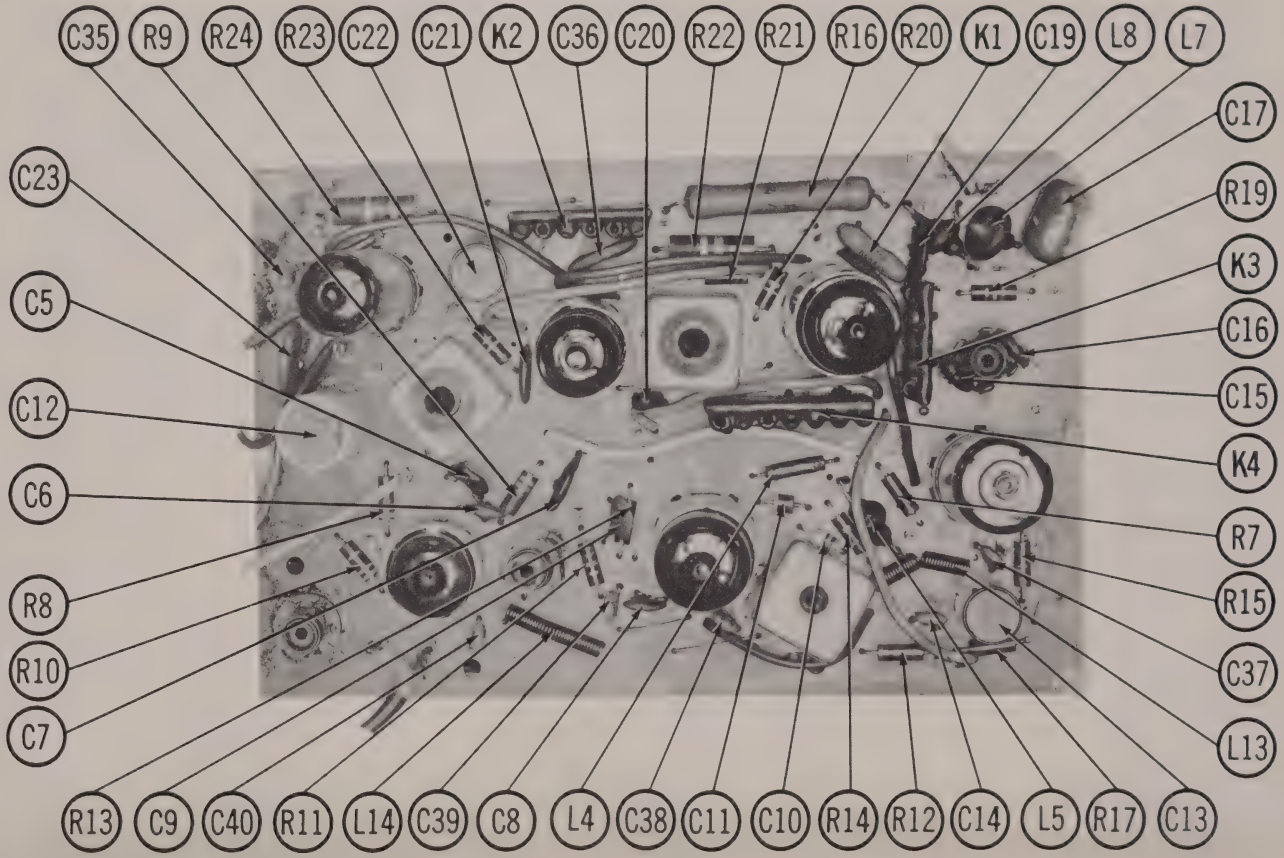
This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



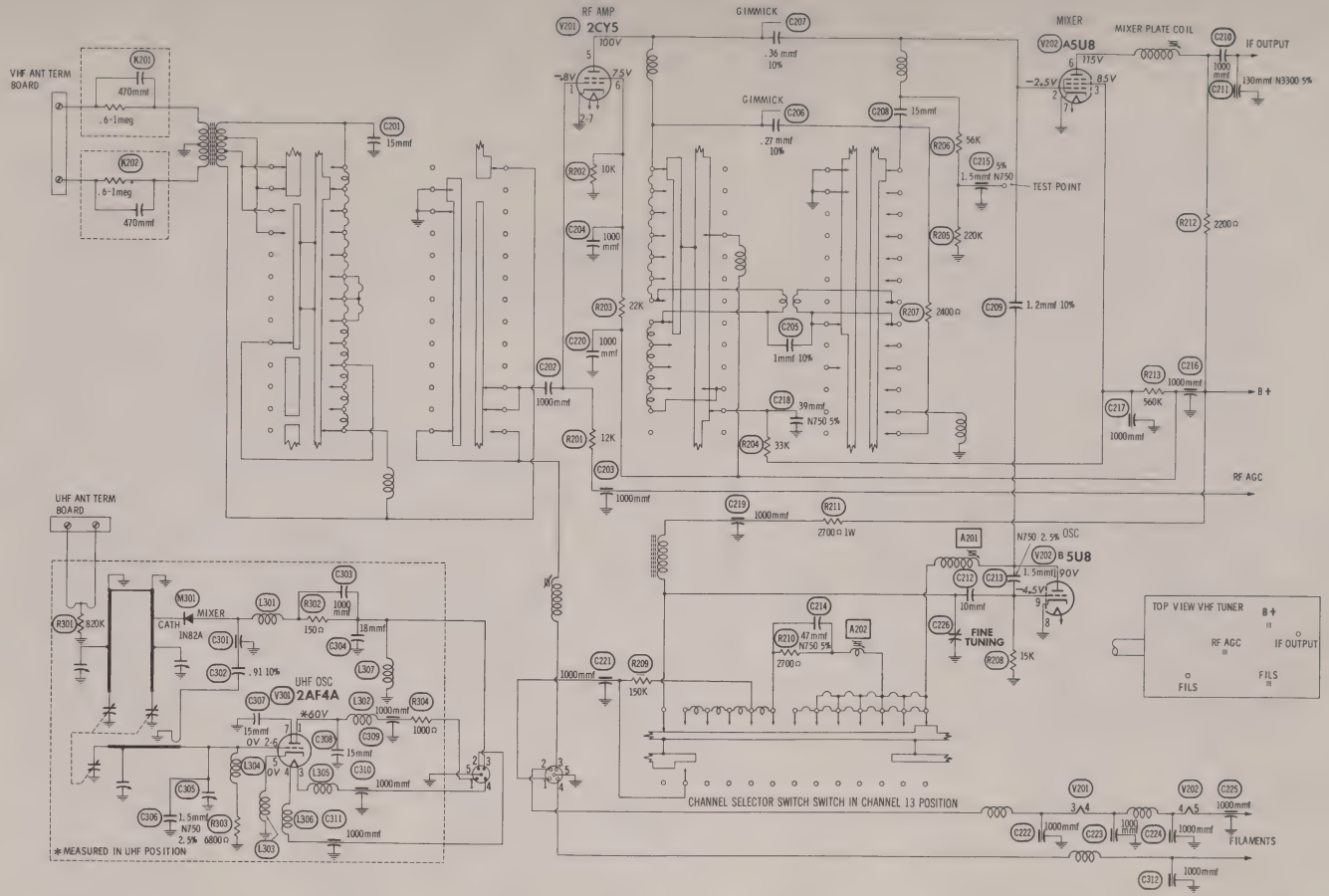
SET 486 FOLDER 2

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

FOLDER 2



MAIN PRINTED BOARD



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UHF TUNER 95-183-0 & VHF TUNER 95-184-0 (UHF-VHF Combined 95-182-0)
UHF TUNER 95-186-0 & VHF TUNER 95-187-0 (UHF-VHF Combined 95-185-0)

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

UHF TUNER PARTS LIST AND DESCRIPTIONS

95-186-0
95-183-0

TUBES

CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA

ITEM No.	USE	TYPE
V301	UHF Osc.	2AF4B

ITEM No.	USE	TYPE

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C301								
C302	.91 10%	#2101-918						
C303	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C304	18			TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C305		#1620-9						
C306	1.5 N750 2.5%	#170-159						
C307	15		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C308	15		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C309	1000		EF-001	MFT-1000		CCF-102	CT280A	
C310	1000		EF-001	MFT-1000		CCF-102	CT280A	
C311	1000		EF-001	MFT-1000		CCF-102	CT280A	
C312	1000		EF-001	MFT-1000		CCF-102	CT280A	

Silvertone Part No.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R301	820K	
R302	150Ω	

ITEM No.	RATING	REMARKS
R303	6800Ω	

ITEM No.	RATING	REMARKS
R302	1000Ω	

COILS (RF-IF)

ITEM No.	USE	Silvertone PART No.	NOTES
L301	UHF Mixer	1785-13	
L302	RF Choke	1785-13	
L303	Cathode Choke	1911-12	
L304	Osc. Coil	1785-9	

ITEM No.	USE	Silvertone PART No.	NOTES
L305	Fil. Choke	1785-70	
L306	Fil. Choke	1785-70	
L307	UHF IF Output	1911-10	

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
	Dial Shaft	5317-545	UHF Tuner #95-183-0 or #95-186-0
	Tuning Shaft	5377-550	UHF Tuner #95-183-0 or #95-186-0
	Selector Shaft	5333-534	Assembly for VHF-UHF Tuner #195-185-0
	Selector Shaft	5333-535	Assembly for VHF-UHF Tuner #195-182-0

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Silvertone PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M301	Kemtron ST-47		1N82A	1N82A	1N82A	UHF Osc. (Clip-in)

TUNER ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VHF OSCILLATOR ALIGNMENT

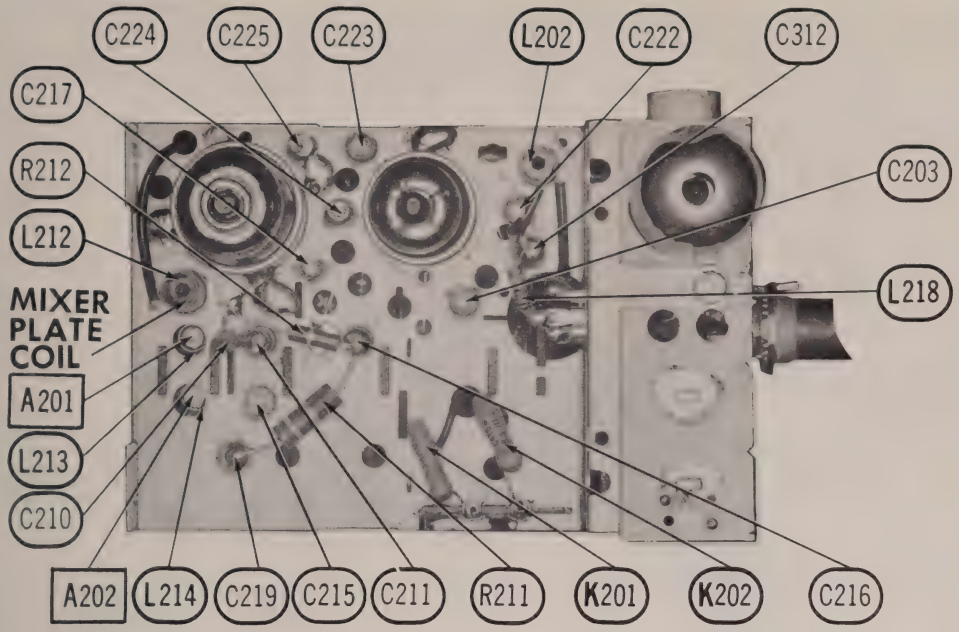
Set the Fine Tuning to the center of its range (flat of fine tuning shaft at right angles to the top of tuner). Set the Channel Selector to the highest high band channel (13-7) operating in the area. Adjust the high band oscillator adjustment slug (A201) for best picture and sound.
Switch Channel Selector to the highest low band (6-2) channel operating in the area and adjust the low band Oscillator Adjustment (A202) for best picture and sound. Recheck high band adjustment.

VHF RF AND MIXER ALIGNMENT

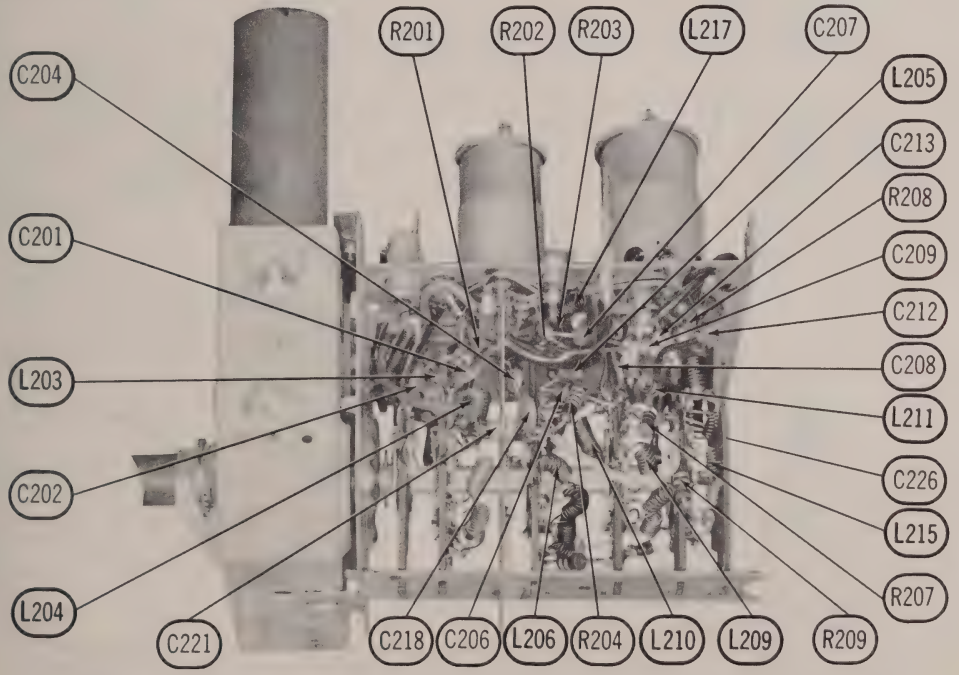
This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

UHF TUNER ALIGNMENT

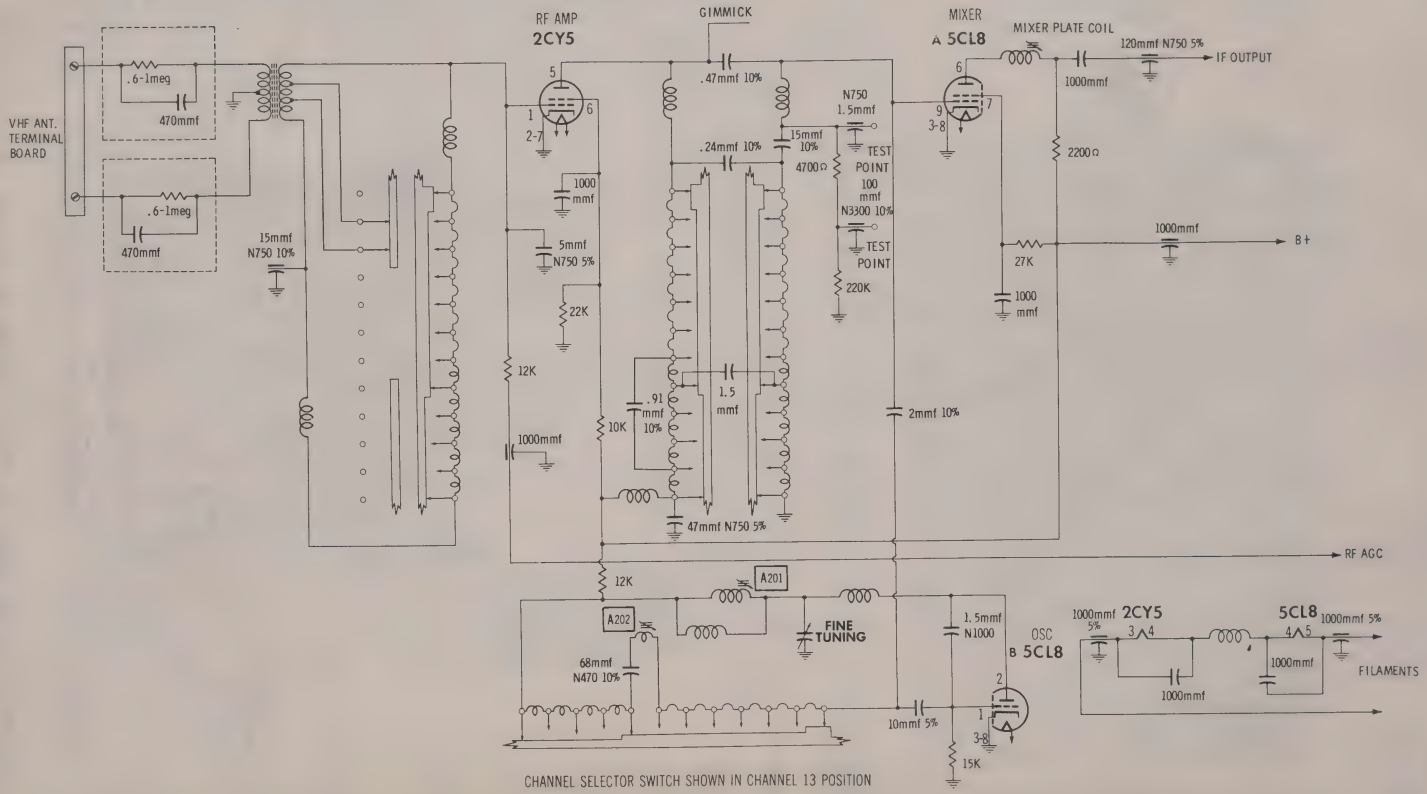
This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.



UHF TUNER 95-186-0 & VHF TUNER 95-187-0 - TOP VIEW
(UHF-VHF TUNER Combined Part #95-185-0)



UHF TUNER 95-186-0 & VHF TUNER 95-187-0 - RIGHT SIDE
(UHF-VHF TUNER Combined Part #95-185-0)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 95-195-0

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Short the antenna terminals together but not to chassis.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .001mfd to pin 2 (grid) of 2nd Video IF Amp. Low side to chassis.	44.0MC (10MC Swp.)	44.0MC	Any non-interfering channel	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across Video Det. load.)	A1	Preset A2 fully counterclockwise. Adjust A1 for maximum gain at 44.0MC as in Fig. 1.
2.	"	"	43.2MC 45.3MC	"	"	A2	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
3.	High side thru .001mfd to pin 1 (grid) of 1st Video IF. Amp. Low side to chassis.	"	44.0MC	"	"	A3	Preset A4 fully counterclockwise. Adjust A3 for maximum gain at 44.0MC.
4.	"	"	43.6MC 45.0MC	"	"	A4	Adjust for maximum gain and symmetry of response similar to Fig. 3.with markers as shown. If necessary, repeat step 1 thru 4 for desired response.
5.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	44.25MC	"	"	Mixer Plate Coil	Detune A5 by turning slug out. Adjust Mixer Plate Coil for maximum gain at 44.25MC.
6.	"	"	42.75MC 43.6MC 45.0MC 45.75MC	"	"	A5	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. Retouch Mixer Plate Coil and A5 until desired response is obtained.

SOUND IF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	High side thru .05mfd to point Ⓑ. Low side to chassis. (.1V output.)	4.5MC (400∿ FM 15KC swp.)	Any non-interfering channel	AC probe to point Ⓒ. Common to chassis.	A6, A7	Adjust for maximum deflection. If two peaks are found, use the greater peak.
8.	Change output to 500 microvolts.	"	"	"	A8, A9	Adjust for maximum deflection. Retouch A7 for maximum deflection.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A10 for MINIMUM beat interference.

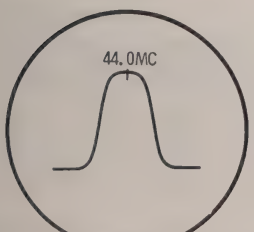


FIG.1

FIG.2

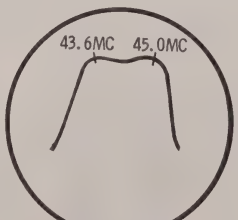


FIG.3

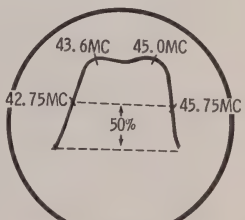


FIG.4

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •
	USE	TYPE	USE	TYPE
V1	1st Video IF Amp.	3CB6		
V2	2nd Video IF Amp. - Video Detector	5AM8		
V3	Video Output - Sync Sep.	6BH8		
V4	Sound IF Amp. - Sync Amp.	5U8		
V5	Audio Detector	3DT6		
V6			Audio Output	5AQ8
V7			Vert. Mult. - Vert. Output	6CM7
V8			Horiz. AFC - Horiz. Osc.	6CG7
V9			Horiz. Output	12AV7/GA
V10			Damper	12AX4/GTA
V11			HV Rect.	1B3GT/5U4GT 1G3GTP

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	SILVERTONE PART No.	GENERAL ELECTRIC PART No.	ECA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V12	ECB24A † 17BJP4 17CFP4 * 21ATP4	ECB24A ①	ECB24A-A ① 17BJP4 ① 17CFP4 ①	ECB24A/ECB24AA ① 17BJP4 ① 17CFP4 ①	ECB24A/ECB24AA ① 17BJP4 ① 17CFP4 ① 21ATP4/21ATP4A ①	① Aluminized ② Silver Screen "SS"

† Models 105, 10-5, 130, 130-5.

* Models 100, 100-5, 101, 101-5, 102BE, 103GY, 103-5BE, 103-5GY.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		SILVERTONE PART No.	ASEVOVX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
	CAP	VOLT							
C1A	120	150	18-80-5	FH3-080	BR3S5S	TC369	TD-150-150	TVA3-3455 *	
B	120	150			BR3S5S		TD-150-150		
C1A	◆60	300	18-84-5	AF3S3-3S-3S	BR3S5S	FP33T.3			
B	◆30	300							
C3A	◆30	300	18-83-5	AF3S3-1S3	BO4S0	FP396	TMD-3B TD-50-50	TVA3-3781.2*	①
B	◆30	300			BR50S				
C4	30	350							
C4	30	350	18-78-5	FH3H3S	BR3S3S	TC6S	TD-30-350	TVA4-1808	

① Some versions may use 5 section (Part #18-33-5), 40-30-30-30 ◇ 300V & 20 ◇ 50V for C3 and C3.

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	ASEVOVX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	FLAMINGO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	2000		BPD-003	BPD-303	BYA10DL	CCD-303	GPS20	5HK-030
C6	1000 10%		DS-1000	DD-102	FM8DJ	CCD-103	GPS20	5YD-D40
C7	5000		BPD-005	BPD-503	BYA10DS	CCD-503	GPS20	5HK-D50
C8	1000 10%		DS-1000	DD-102	FM8DJ	CCD-103	GPS20	5HK-D50
C9	1000		BPD-001	DD-103	BYA10DK	CCD-102	GPS20	5HK-D10
C10	5.1 10%		NPO-5T 5.1	TCZ-5R3	C10Y3C	CCT0-5R3	CNO-5T	5TCC-Y32
C11	10		NPO-5T 10	TCZ-100	C10Q3C	CCT0-100	CNO-5T	10TCC-Q20
C12	.33 300V		P4S3N-33		BC5F3S	3DP-4-334	GEM-3S2S	4SE-P32
C13	.047 400V		P4S3N-047	DD-503	BC5S4J	4DP-3-473	ACE3547	4SE-947
C14	1000		BPD-001	DD-103	BYA10DK	CCD-102	GPS20	5HK-D10
C15	33 NPO					*		10TCP-Q33
C16	33 NPO					*		10TCP-Q33
C17	.047 400V		P4S3N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-947
C18	.047 400V		P4S3N-1	DF-104	CUB4S47	4DP-3-104	GEM-4T4	4TM-P6
C19	2000		BPD-002	DD-202	BYA10DZ	CCD-203	GPS20	5HK-D20
C20	8.5 W780				C10Y6U			10TCC-Y83
C21	10000		BPD-001	DD-103	BYA10DE	CCD-103	GPL10	5HK-E0
C22	.047 400V		P4S3N-047	DD-503	BC5S4J	4DP-3-473	ACE3547	4SE-947
C23	5000 300V			D3S0-503	BYC3D05	3CCD-503	3HV-347	B1-D50
C24	5000 400V 10%		V94C5D50-10%		P5M2S6	5DP-4-503	GEM-1S03S	6TM-1S6S
C25	.005 400V 10%		P5S4C3M-005			5DP-3-503		
C26	.1 400V		P4S3N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C27	.01 1000V 10%					3DP-3-103	GEM-1S1	10TM-S1
C28	.33 300V		P3S3N-33		CUB2P33	3DP-4-334	GEM-3S3	4TM-P33
C29	.01 1000V		1489-00S3		S3S7T5	CM-1S3-3S1K	MC3S43	M3-339
C30	.01 600V		P4S3N-01	DS-103	CUD3S1	6DP-3-103	GEM-6S1	6TM-S1
C31	1000 PX		1489-001		1S3L6	CM-1S5-103J	MC2E5S	M5-S
C32	.047 400V		P4S3N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-947
C33	270 3000V NPO	10%	#15-271J1K					
C34	470 3000V NPO	10%	#15-471J1K					
C35	1000		BPD-001	DD-103	BYA10DK	CCD-102	GPE20	5HK-D10
C36	10000		BPD-01	DD-103	BYA10DE	CCD-103	GPL10	5HK-E0
C37	1000		BPD-001	DD-103	BYA10DK	CCD-102	GPE20	5HK-D10
C38	1000		BPD-001	DD-102	BYA10DK	CCD-102	GPE20	5HK-D10
C39	1000		BPD-001	DD-102	BYA10DK	CCD-102	GPE20	5HK-D10
C40	1000		BPD-001	DD-102	BYA10DK	CCD-103	GPE20	5HK-D10

① Values may vary. Replace with original value. # Silvertone Part Number.

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	1	34-304-5	B-70-5	A47-1meg-Z	Q33-137	TA15A	Volume
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	T8-1	U3-38	Power Off-On
R2A	500Ω	½	34-75-1	B-4	A47-500-S	Q33-1S	TA52L	Contrast
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R3A	5meg	½	34-264-1	B-56	A47-4meg-S	S11-340	RU6SL	Brightness
B	Shaft			Not Req.	K38-4	S1L	SL3S0	
C	Bushing			Not Req.	Not Req.	Not Req.	SL38	
R4A	1meg	½	34-113-1	B-56	A47-1meg-S	Q33-137	TA52L	Vert. Hold
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R5	3.5meg	½	34-140-1					Height
R6	3500Ω (CSW)	34-153-1				110-3000 *	FY15K *	Vert. Linearity
	7000 (Rip)							

* Use 680Ω resistor in series with terminal.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R7	1meg		R30	100K		R33	33K 1W	
R8	6800Ω		R31	150Ω		R34	150K 1W	
R9	330Ω		R32	10K 1W		R35	8200Ω	
R10	47Ω		R33	100K		R36	6800Ω 2W	
R11	15K		R34	180Ω 1W		R37	47Ω 1W	Note 1
R12	1000Ω		R35	680K		R38	820Ω	
R13	330Ω		R36	1.5meg		R39	3.9Ω	
R14	5600Ω		R37	180K		R40	4700Ω	
R15	1meg		R38	2.2meg		R41	4.5Ω 10W	#61-115-0
R16	330Ω 4W	#61-13-1	R39	100K 1W		R42	560Ω 2W	
R17	330Ω		R40	560Ω	Note 1	R43	180Ω 10W	#61-135-0
R18	33Ω		R41	560Ω	Note 1	R44	60Ω 3W	#61-117-0
R19	180K		R42	470Ω 1W		R45	200Ω 1W	#61-61-0

Silvertone Part Number.

Note 1. Value may vary. Replace with same value as original.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Cramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	1st Video IF	10-38-5	30-1044	30-1044	TV-131	6236		
L2	2nd Video IF	10-37-5						
L3	3rd Video IF	10-39-5						
L4	RF Choke	10-98-1				4613		1Ah
L5	Series Peaking Coil	10-84-1	19-3060	19-3060	TV-193	6110		60uh
L6A	4.5MC Trap	10-103-1						
B	1st Sound IF							
L7	Series Peaking Coil	10-96-1 †	19-3250 ▲	19-3250 ▲	TV-196 ▲	6130 ▲	VP-6 ▲	270uh ①
L8	Shunt Peaking Coil	10-85-1 *	19-3250	19-3250	TV-198	6130	VP-6	269uh
L9	2nd Sound IF	10-23-5						
L10	Quadrature Coil	10-25-5						
L11	RF Coil	10-126-1	19-1002	19-1002	SW-620	4606		2.5uh
L12	RF Coil	10-94-1	19-3060	19-3060	TV-193	6110		60uh
L13	Fil. Choke	10-156-1						
L14	Fil. Choke	10-154-1						
L15	Line Choke	10-149-1	19-3026	19-3026	TV-180	6176	VP-1	40uh
L16	Line Choke	10-149-1	19-3026	19-3026	TV-180	6176	VP-1	40uh

① Wound on 15K Resistor. † Alternate Part #10-150-1. * Alternate Part #10-447-1.

▲ Parallel with 15K Resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L17A	810		10-38-5						Horiz. Osc., Tap @ 220
B	50Ω								Horiz. Waveform

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								NOTES
		SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Output	80-1-2		A-2834 ①	V31S ①		VO-10 ②			A-1S3X
T2	Yoke-Horiz. (RMGI) (90)-Vert. (40ME)	80-3-4	T-16 ③④	M2F-02 ③④	TRVP10/40 ③④	PCM2045 ③④	DY-48A ③④	T-16 ③④		T-4S ② VW-1 ③ YC-1 & C1-1
	Rear Cover and Centering Device	83-936								
	Alt. Centering Device	83-1034								
	Yoke Clamp	23-3-2								
T3	Horiz. Output	80-1-3	FLY-168 *	EVD-168 *				FLY-168 *	D-161 *	

① Cut and tape blanking lead. ② Use original horiz. yoke damping network if necessary.

③ Drill new mounting holes ④ Connect same as original.

⑤ Mount with leads out bottom. Jumper yoke #6 to yoke #5. Connect yoke #1 to plug #7; yoke #3 and #7 to plug #2; yoke #6 and #5 to plug #5. yoke #4 to plug #3.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	5	4			5	5	5
3	4	3			4	4	4
2	3	2	-	-	3	3	3
1	1	1			1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
	PRI. SEC.							
T4	4900Ω 3-4Ω	80-2-1D ①	34848	A-3036	AU-601	A-3077	34848	S-5X

① Alternate Part #80-2-1

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	33-388-4	4A07	Models PC-100, PC-100-5, PC-110, PC-110-5, PC-120, PC-130-5, 100, 100-5, 102, 105-5, 130, 130-5
	4"	PM	3-4Ω	33-438-4		Models 101, 101-5, 103, 103-5, PC101, PC101-5, PC-103, PC-103-5
	4"	PM	3-4Ω	33-367-4		Includes Bracket. Models 102BE, 103GY, 103-5BE, 103-5GY, PC-102BE, PC-103GY, PC-103-5BE, PC-103-5GY

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
X1	Sound IF Screen	4700mmf, 5KV	12-2-3	
X2	Audio Coupling	220mmf, 4700mmf, 10000mmf, 6800, 5KV, 8500, 8500	12-3-5	
X3	Sync Sep. Grid	220mmf, 330mmf, 470mmf, 220, 270K, 3, 5meg	12-8-5	
X4	Sync Amp. Cathode	1000mmf, 1500, 2200, 3300, 4200, 470K	12-21-5	Sprague PRC-4
X5	Vert. Integrator & Picture Tube Grid	2000mmf, 9000mmf, 9000mmf, 9000mmf, 12K, 22K, 22K, 33K, 56K, 56K	12-23-3	Sprague V-24
X6	Horiz. AFC & Osc.	68mmf, 220mmf, 5000mmf, 10000mmf, 18000mmf, 8200, 270K, 330K, 470K, 470K, 680K	12-25-5D *	
X7	Isolation	1000mmf (1000VAC), 4.7meg	12-17-3	

* Alternate Part #13-25-5 or 13-39-3.

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	CURRENT (Measured)		SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.340A		56-3-3 *	T350 *	1N418A *	356A *	6R500 †	* Selenium Type
M3	.340A		56-3-2 *	T350 *	1N418A *	350A *	6R500 †	† Silicon Type

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuner	96-185-0	UHF-VHF (Combined Tuners 96-187-0 & 96-186-0)
	Tuner	96-187-0	VHF with UHF Provisions
	Tuner	96-186-0	UHF
	Tuner	96-183-0	UHF-VHF (Combined Tuners 96-184-0 & 96-183-0)
	Tuner	96-184-0	VHF with UHF Provisions
	Tuner	96-182-0	UHF
	Tuner	96-181-0	VHF
	Antenna	45-1377-0	FM Replacement Type #TA338
		82-136-0	Alternate
		82-137-0	Alternate
M4	Circuit Breaker	43-2-2	Alternate Part #43-10-2
	Circuit Breaker	43-2-3 or 43-4-2	Models PC-102BE, GY, PC-102-5BE, -5GY, 102BE, GY, 103-5BE, -5GY
M5	Width Coil	83-1334	
	Width Device	83-1033	Models 110, 110-5, 120, 120-5, PC-110, PC-110-5, PC-120, 120-5
	Width Device	83-1304	Models 102, 102-5, 102BE, GY, 103-5BE, -5GY, PC-100, PC-100-5, PC-102BE, GY, PC-103-5BE, -5GY
M9	Magnet	27-86-2	Beam Aligner (May not be used in some models)
	Printed Board	84-1785-1	17, Sync, Sound, less tubes
	Printed Board	84-1908-1	Horiz. & Vert. Osc., less tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	42-137-0	Models 100, 100-5, 102GY, BE, -5GY, -5BE
Safety Glass	42-448-0	Models 110-5, 105, 105-5
Knob	52-1304-0	VHF Channel Selector, Models 101, 103, PC-101, PC-103
Knob	52-1081-0	VHF Channel Selector, Models 102BE, GY, PC-102BE, GY
Knob	52-389-0	VHF Channel Selector, Models 102-5BE, -5GY, PC102-5BE, -5GY
Knob	52-391-0	VHF Channel Selector, Models 103-5, 105-5, PC-103-5, PC-105-5
Knob	52-397-0	VHF Channel Selector, Models 110, 120, PC-110, PC-120
Knob	52-396-0	VHF Channel Selector, Models 110-5, 120-5, PC-110-5, PC-120-5
Knob	52-901-0	VHF Channel Selector, Models 100, PC-100
Knob	52-907-0	VHF Channel Selector, Models 100-5, PC-100-5
Knob	52-383-0	UHF Channel Selector, Models 102-5BE, -5GY, 102-5BE, -5GY
Knob	52-385-0	UHF Channel Selector, Models 103-5, 105-5, PC-103-5, PC-105-5
Knob	52-1293-0	VHF Fine Tuning, Models 105, 103, PC-105, PC-103
Knob	52-1295-0	VHF Fine Tuning, Models 105-5, 103-5, PC-105-5, PC-103-5
Knob	52-384-0	VHF Fine Tuning, Models 102-5BE, -5GY, PC-102-5BE, PC-103-5GY
Knob	52-388-0	VHF Fine Tuning, Models 110-5, 120-5, PC-110-5, PC-120-5
Knob	52-902-0	VHF Fine Tuning, Models 100-5, PC-100-5
Knob	52-1082-0	VHF Fine Tuning, Models 102BE, GY, PC-102BE, GY
Knob	52-1049-0	VHF Fine Tuning, Models 110, 120, PC-110, PC-120
Knob	52-902-5	VHF Fine Tuning, Models 100, PC-100
Knob	52-1083-0	UHF Fine Tuning, Models 103-5, 105-5, PC-103-5, PC-105-5
Knob	52-880-0	UHF Fine Tuning, Models 100-5, PC-100-5
Knob	52-1290-0	Dial Indicator, Models 105-5, 103-5, PC-105-5, PC-103-5
Knob	52-885-0	Dial Indicator, Models 103-5BE, -5GY, PC-103-5BE, -5GY
Knob	52-886-0	Dial Indicator, Models 110-5, 120-5, PC-110-5, PC-120-5
Knob	52-905-0	Dial Indicator, Models 100-5, PC-100-5
Knob	52-1295-0	Volume, Brightness, Contrast, Vertical Hold, Models 101, 101-5, 103, 103-5, PC-101, -101-5, -103, -103-5
Knob	52-1293-0	Volume, Brightness, Contrast, Vertical Hold, Models 105, 105-5, 120, 120-5, PC-105, -105-5, -120, -120-5
Knob	52-364-0	Volume Control On-Off, Models 100, 100-5, 102BE, GY, 103-5BE, -5GY, PC-100, -100-5, -102BE, -103GY, -103-5GY, -103-5BE
Knob	52-363-0	Brightness, Models 102GY, BE, -5GY, -5BE, 100, 100-5, PC-103GY, BE, -103-5GY, -103-5BE, -100, -100-5

SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

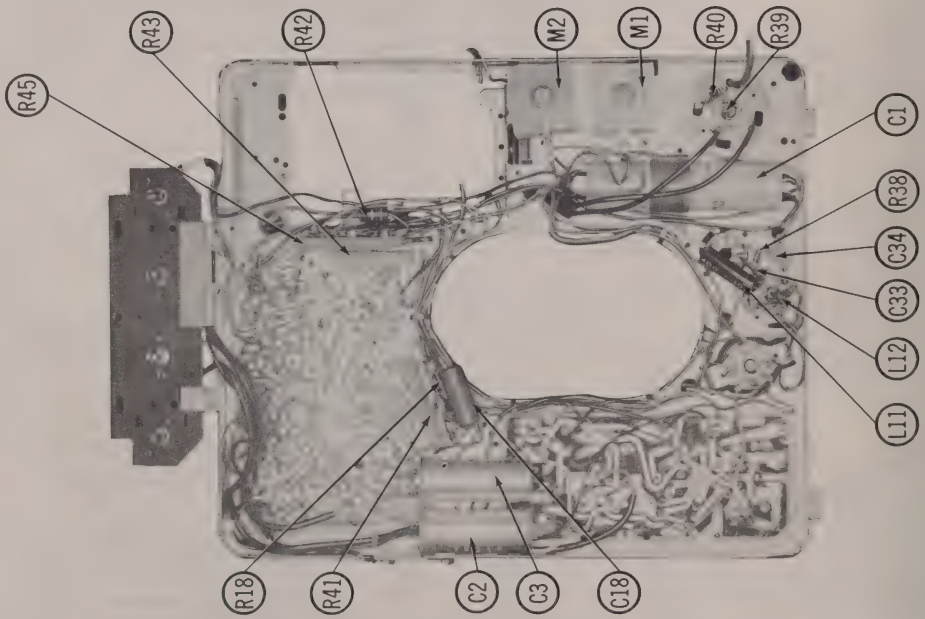
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

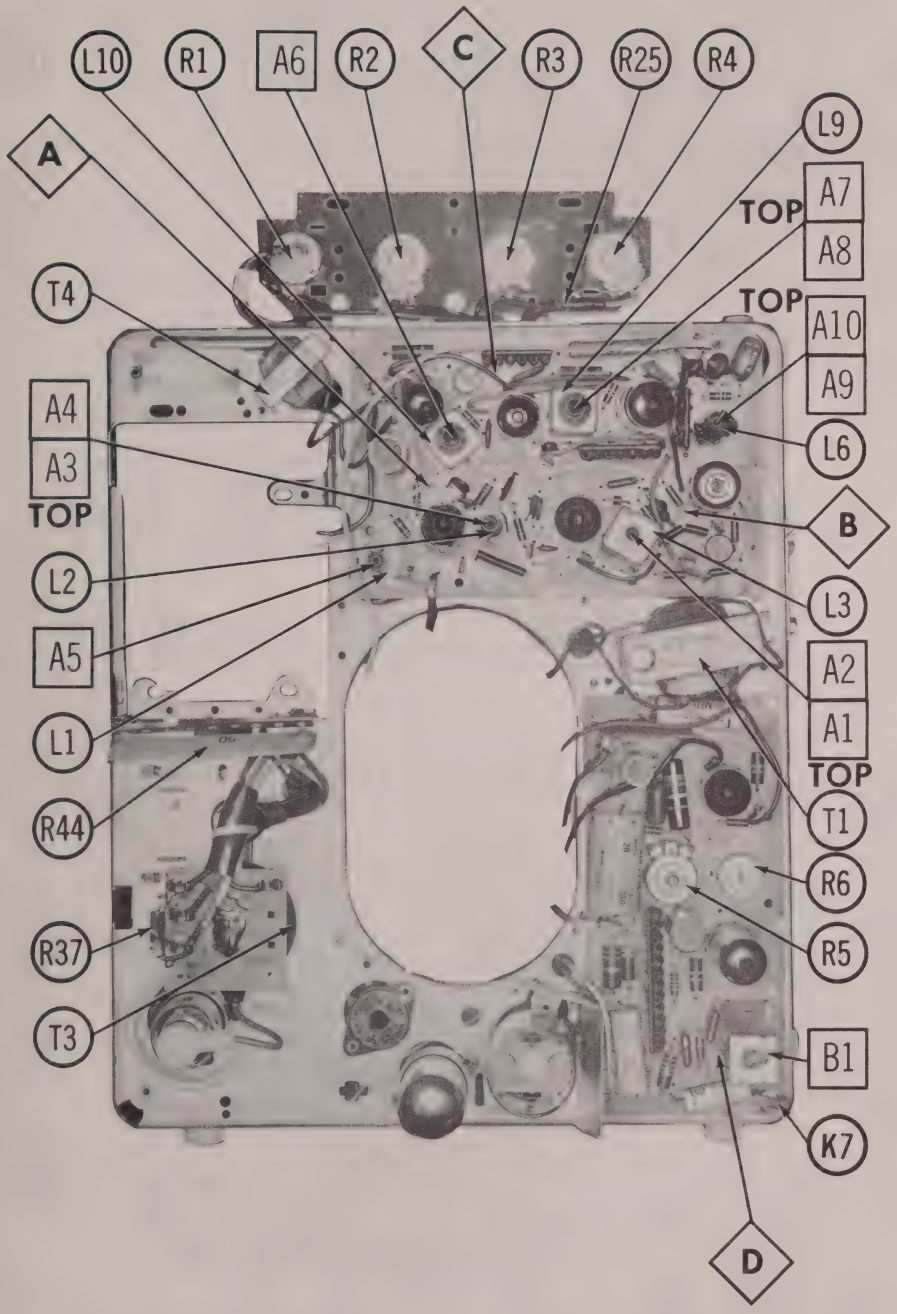
NAME	PART NO.	DESCRIPTION
Knob	52-861-0	Contrast, Models 102GY, BE, -5GY, -5BE, 100, 100-5, PC-102GY, BE, -102-5GY, -102-5BE, -100, -100-5
Knob	52-862-0	Vertical Hold, Models 102GY, BE, -5GY, -5BE, 100, 100-5, PC-102GY, BE, -102-5GY, -102-5BE, -100, -100-5
Cabinet	42-140-0	Models 110, 110-5, PC-110, -110-5 (Mahogany)
Cabinet	42-141-0	Models 120, 120-5, PC-120, -120-5 (Mahogany)
Cabinet	42-166-0	Models 103, 103-5, PC-103, -103-5
Cabinet	42-157-0	Models 101, 101-5, PC-101, -101-5
Cabinet	42-123-0	Models 100, 100-5, PC-100, -100-5
Cabinet Legs	49-486	Models 120, 120-5, PC-120, -120-5
Handle	49-518	Models 101, 101-5, PC-101, -101-5
Handle	49-186	Models 102GY, BE, -5GY, -5BE, PC-102GY, BE, -5GY, -5BE
Handle	82-165-0	Models 103, 103-5, PC-103, -103-5 (Includes Antenna)

WIRING DATA

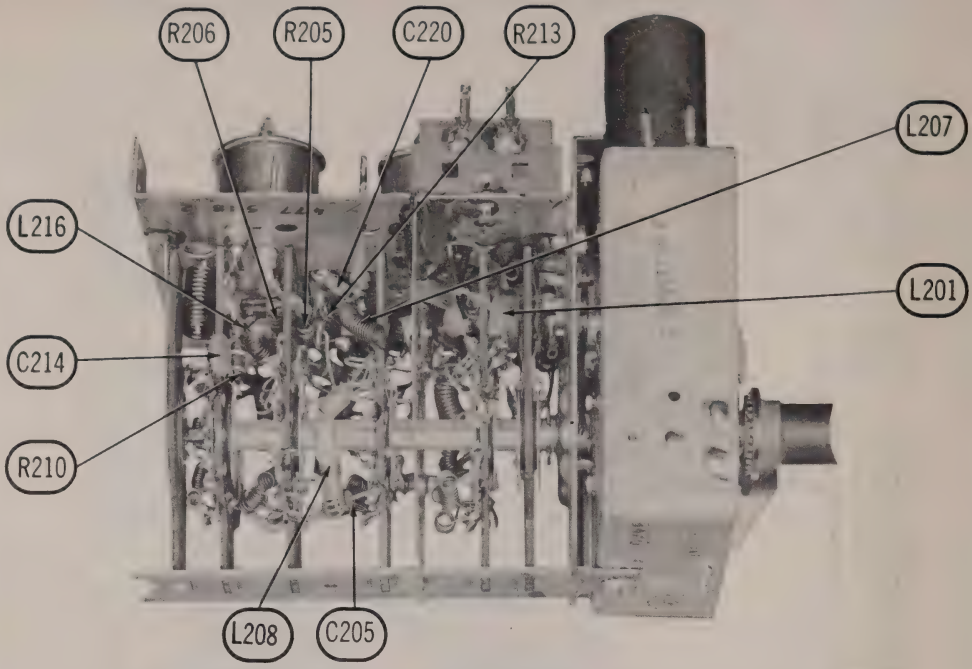
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



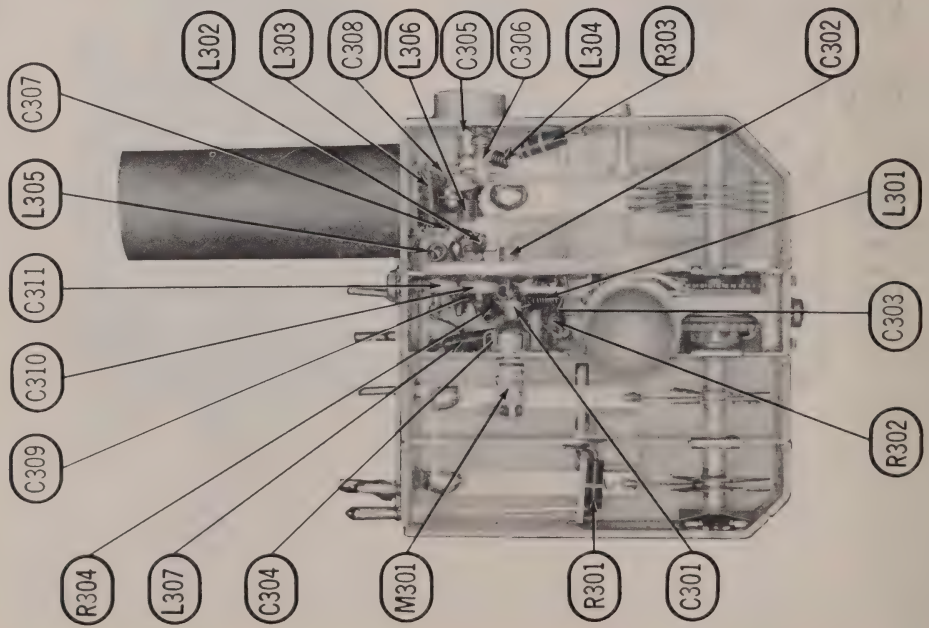
CHASSIS BOTTOM VIEW



CHASSIS - TOP VIEW



UHF TUNER 95-186-0 & VHF TUNER 95-187-0 - LEFT SIDE
(UHF-VHF TUNER Combined Part #95-185-0)



UHF TUNER 95-186-0

VHF TUNER PARTS LIST AND DESCRIPTIONS

95-187-0
95-184-0

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	2CY5	V202	Mixer-Osc.	5U8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	15		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C202	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C205	1 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C206	.27 10%	#2101-278						
C207	.36 10%	#2101-368						
C208	15		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C209	1.2 10%	#2101-129						10TCC-V12
C210	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C211	130 N3300 5%	#262-131						
C212	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C213	1.5 N750 2.5%	#174-159						
C214	47 N750 5%			DTZ-47	C10Q47U		CN7-447	10TCU-Q47
C215	1.5 N750 5%	#259-159						
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	39 N750 5%			TCZ-39	C10Q39U		CNO-439	10TCU-Q39
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	
C223	1000		EF-001	MFT-1000		CCF-102	CT280A	
C224	1000		EF-001	MFT-1000		CCF-102	CT280A	
C225	1000		EF-001	MFT-1000		CCF-102	CT280A	
C226		#5322-506						

Silvertone Part No.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	12K	
R202	10K	
R203	22K	
R204	33K	
R205	220K	

ITEM No.	RATING	REMARKS
R206	56K	
R207	2400Ω	
R208	15K	
R209	150K	
R210	2700Ω	

ITEM No.	RATING	REMARKS
R211	2700Ω 1W	
R212	2200Ω	
R213	560K	

COILS (RF-IF)

ITEM No.	USE	Silvertone PART No.	NOTES
L201	Ant. Trans.	2309-4	
L202	UHF IF Input	5251-7	
L203	RF Choke	300-3	
L204	Ant. Coils	2876-502	Channel 2-13, Includes Wafer Assy.
L205	RF Choke	301-8	
L206	RF Coils	2877-502	Channel 2-13, Includes Wafer Assy.
L207	RF Choke	362-7	
L208	Low Band Coupling Trans.	5380-5	
L209	Mixer Grid Coils	2878-503	Channel 2-13, Includes Wafer Assy.

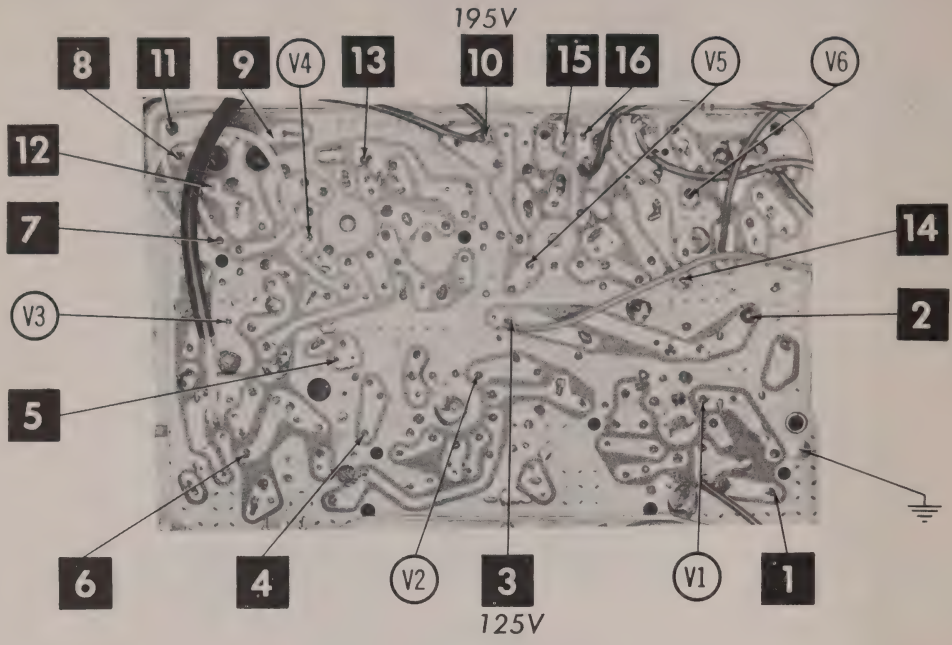
ITEM No.	USE	Silvertone PART No.	NOTES
L210	RF Choke	363-7	
L211	RF Choke	301-5	
L212	Mixer Plate	5359-5	
L213	High Band Osc. Adj.	5381-30	
L214	Low Band Osc. Adj.	5381-31	
L215	Osc. Coils	2879-502	Channel 2-13, Includes Wafer Assy.
L216	RF Choke	1894-9	
L217	Fil. Choke	301-10	
L218	Fil. Choke	310-8	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Silvertone PART No.	REPLACEMENT DATA	
K201	Antenna Filter	470mmf, .6-1meg	332-1	Centralab	RC-471
				Sprague	AC1-1
K202	Antenna Filter	470mmf, .6-1meg	332-1	Centralab	RC-471
				Sprague	AC1-1

MISCELLANEOUS

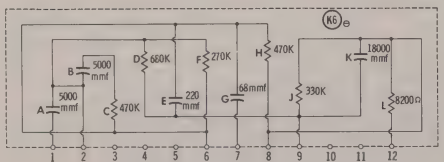
ITEM No.	PART NAME	Silvertone PART No.	NOTES
	Selector Shaft	5333-534	Assembly for VHF-UHF Tuner #195-185-0
	Selector Shaft	5333-535	Assembly for VHF-UHF Tuner #195-182-0

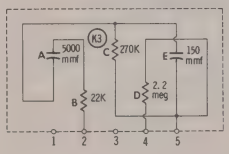


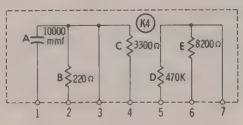
A Howard W. Sams CIRCUITRACE® Photo

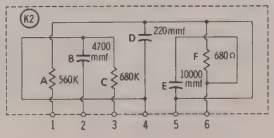
MAIN PRINTED BOARD

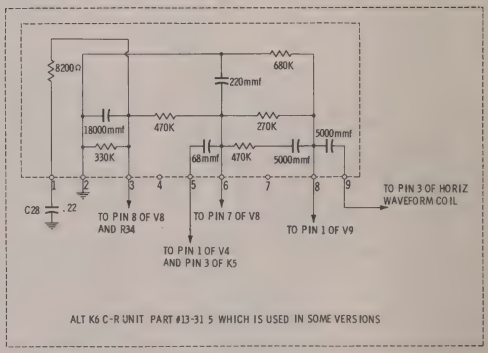
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED











A PHOTOFACT STANDARD NOTATION SCHEMATIC

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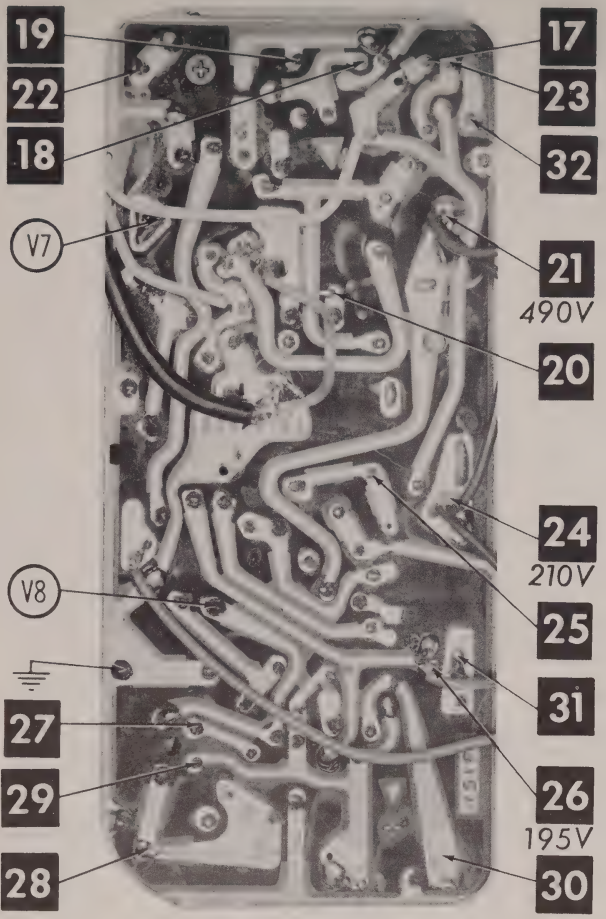
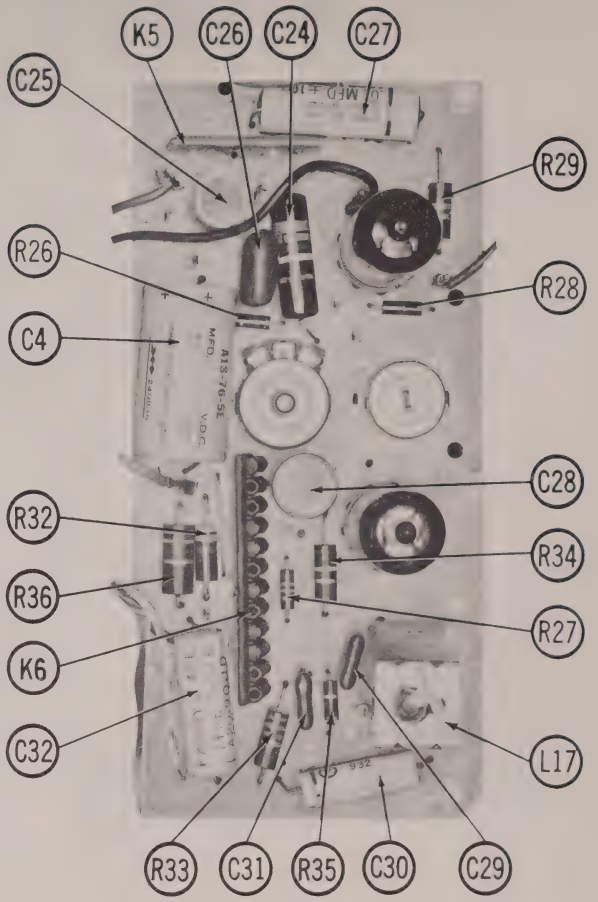
COMPONENT COMBINATION LAYOUT





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ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

SWEEP PRINTED BOARD

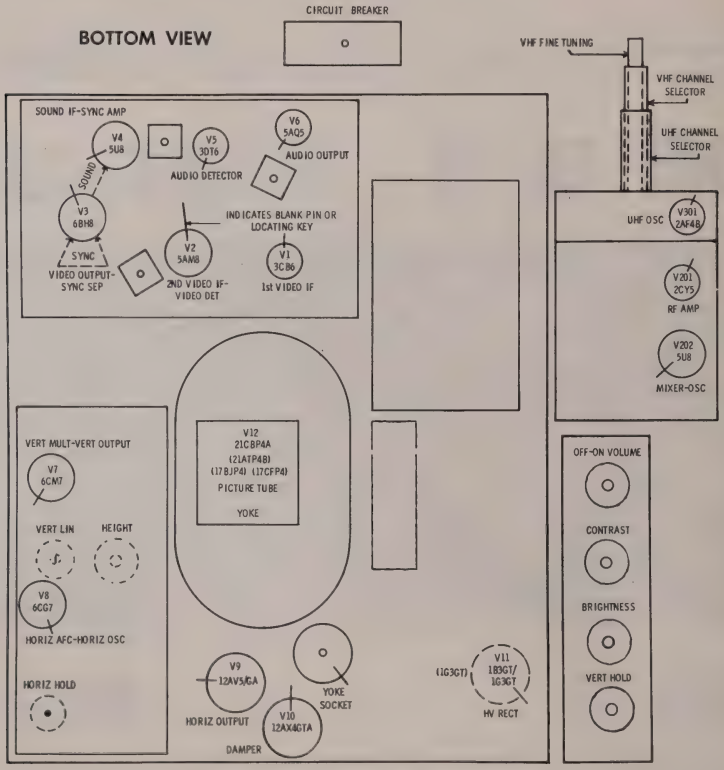
SILVERTONE CHASSIS 456.50340, 341, 342, 343, 528.50340, 341, 342, 343

RESISTANCE MEASUREMENTS

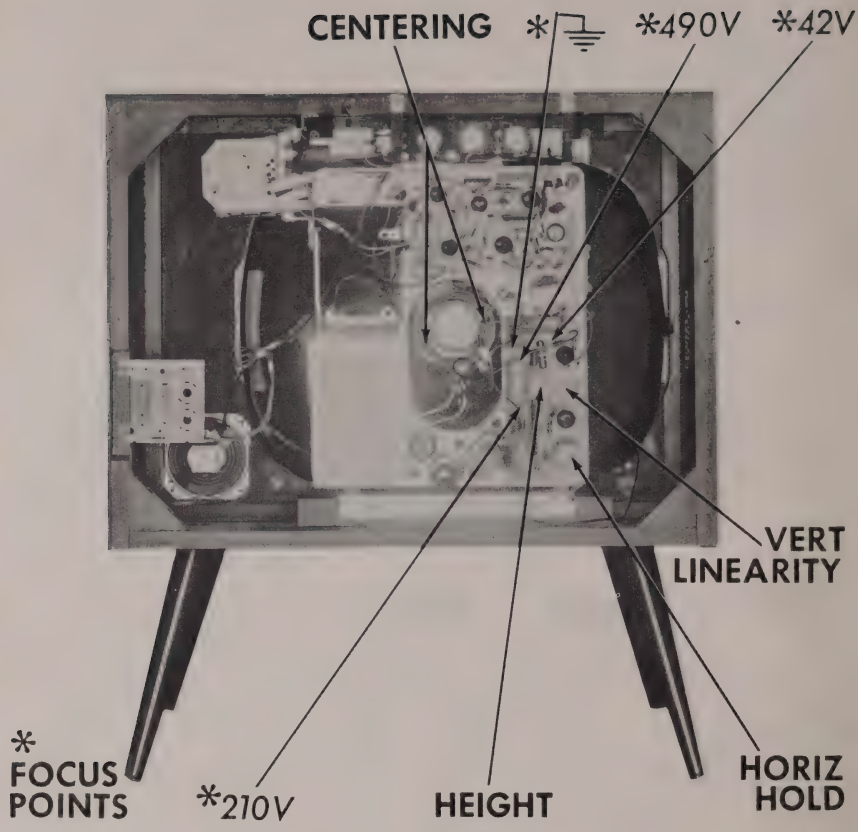
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3CB6	1meg	47Ω	2.9Ω	4Ω	†1900Ω	†1900Ω	0Ω		
V2	5AM8	220Ω	.3Ω	†2600Ω	4Ω	5Ω	†2600Ω	0Ω	5600Ω	0Ω
V3	6BH8	0Ω	2.2meg	†470K	6.5Ω	5Ω	• 50Ω	1meg	†3800Ω	†4000Ω
V4	5U8	†9800Ω	4Ω	†80K	6.5Ω	8Ω	†11K	220Ω	3300Ω	†470K
V5	3DT6	5.2Ω	680Ω	8Ω	9Ω	¶900K	†11K	560K		
V6	5AQ5	0Ω	180Ω	9Ω	9.5Ω	†930Ω	†560Ω	0Ω		
V7	6CM7	‡2100Ω	NC	0Ω	12.5Ω	11Ω	•†3.2meg	• 1.3meg	2.2meg	• 2500Ω
V8	6CG7	†33K	450K	0Ω	14Ω	12.5Ω	†470Ω	500K	300K	NC
V9	12AV5GA	500K	14Ω	0Ω	NC	‡67Ω	NC	17Ω	†6800Ω	
V10	12AX4GTA	TP	NC	¶250K	NC	†4.7Ω	TP	20Ω	17Ω	
V11	1B3GT 1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡490Ω
V12	21CBP4A	11Ω	68K	Pin 6 †4.7Ω	Pin 10 ‡0Ω	Pin 11 • 620K	Pin 12 9.5Ω			
V201	2CY5	1meg	0Ω	2Ω	1.5Ω	†1600Ω	†12K	0Ω		
V202	5U8	†4300Ω	275K	†35K	1.5Ω	0Ω	†3800Ω	0Ω	0Ω	15K
V301	2AF4B	†*5300Ω	6800Ω	2.9Ω	2Ω	.2Ω	6800Ω	†*5300Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 210V SOURCE.
‡ MEASURED FROM PIN 3 OF V10.
* MEASURED IN "UHF" POSITION

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Tune in a TV station and adjust the Horizontal Hold until the picture synchronizes horizontally. If the picture cannot be synced with the Horizontal Hold, turn the Waveform slug (B1) several turns out of the coil form from its original position. Readjust the Horizontal Hold until the picture synchronizes horizontally.

Connect the vertical amplifier of the scope thru a low capacity probe to point Ⓓ. Connect low side to chassis. Retouch the Horizontal Hold to synchronize the picture.

Adjust the Waveform slug (B1) for a Waveform similar to Fig. 5 with the sharp peak approximately 10% higher than the broad peak. Keep the picture in sync during this adjustment with the Horizontal Hold. Remove scope connection and retouch Horizontal Hold if necessary to synchronize picture horizontally.

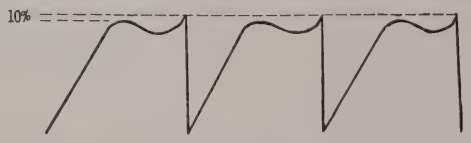


FIG. 5

PHOTOFACT® Folder

ADMIRAL MODELS 618, 619, 722, 723, 724, 729, 771, SS722, SS723, SS724, SS729 (Ch. 4F3)

ADMIRAL MODELS 618, 619, 722, 723, 724, 729, 771, SS722, SS723, SS724, SS729 (Ch. 4F3)

MODEL 771

ADMIRAL MODELS 618, 619, 722, 723, 724, 729, 771, SS722, SS723, SS724, SS729 (Ch. 4F3)

TRADE NAME	Admiral Models 618, 619, 722, 723, 724, 729, 771 (Ch. 4F3) SS722, SS723, SS724, SS729 (Remote Speaker Unit)
MANUFACTURER	Admiral Corp., 3800 W. Cortland Street, Chicago 47, Illinois
TYPE SET	AC Operated 4 Tube Stereo Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 64 Watts, .6 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER RC668-18P USED IN MODELS 618, 619, 722, 723, 724, 729 OR RECORD CHANGER A2400-001-002 USED IN MODEL 771 — SEE ADMIRAL RC607 SERIES — PHOTOFACT SET 398 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JT682

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel Output	EL84/6BQ5
V3	Right Channel Output	EL84/6BQ5
V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	70	300	67B23-9	PR4-295		WT407		TVAS-3561 *	
B	50	300							
C	30	250							
C2	20	250	67B4-41	PRS1570	BR2025	TC55	TD-20-250	TVA-1508	
C3	10	6	67B35-7	PWE6010	EC10-6	TT6X10	ML10-6	TE-1087	
C4	50	25	67B4-31	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	35		NPO-S1 36	TCZ-36	C10Q36C	CCTO-360	GP439	10TS-Q39
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C7	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C8	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D5
C9	.033 400V		P488N-033	DD-303	CUB4S33	4DP-2-333	GEM-4133	4TM-S33
C10	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C11	35		NPO-S1 36	TCZ-36	C10Q36C	CCTO-360	GP439	10TS-Q39
C12	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C13	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C15	.033 400V		P488N-033	DD-303	CUB4S33	4DP-2-333	GEM-4133	4TM-S33
C16	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C17	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg 1meg Tap	1/2	75B46-3				FA36T95	Loudness, Right Channel
B	3meg 1meg Tap	1/2					RU36T16	Loudness, Left Channel
C	Shaft						CS3500	
R2A	500K	1/2	75B46-6	B-60	AD47-500K-Z		FA55A	Tone, Right Channel
B	500K	1/2		SR-60	Not Req.		RU55A	Tone, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	1.5meg	1/2	75D1-118	B-742	A47-1.5meg-S	Q11-138	U155	Balance
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

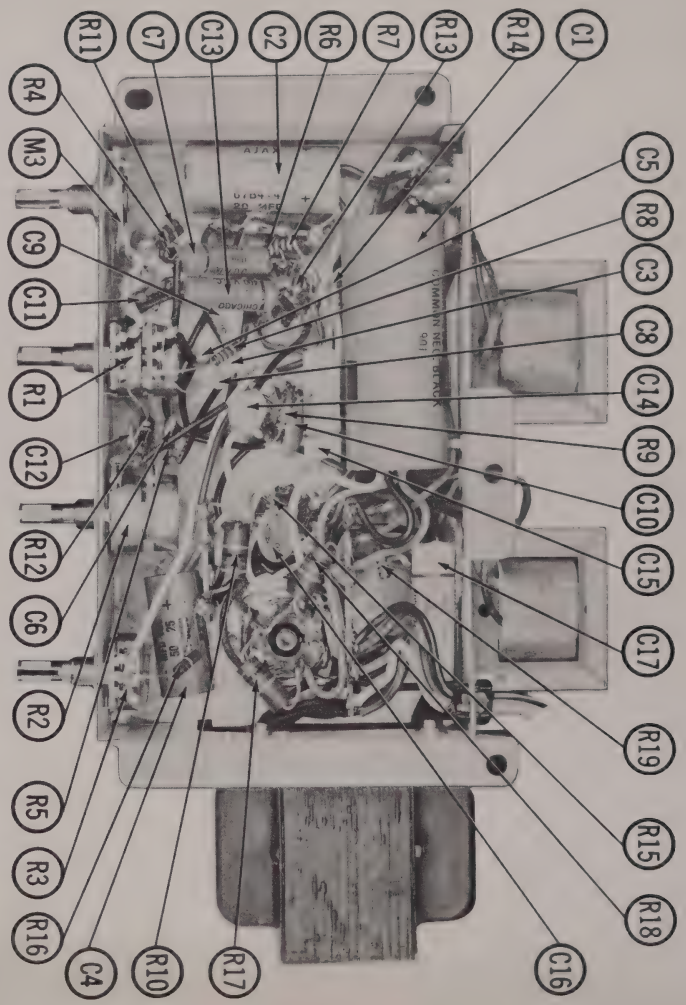
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	3.3meg	
R5	100K	
R6	3.3meg	
R7	470K	
R8	2200Ω	
R9	470K	

ITEM No.	RATING	REMARKS
R10	82Ω 2W	
R11	3.3meg	
R12	100K	
R13	3.3meg	
R14	470K	
R15	470K	

ITEM No.	RATING	REMARKS
R16	22K	
R17	100Ω 2W	
R18	1000Ω 2W	
R19	27K	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .6A	520 VCT ⓐ .080A	5V ⓐ 2A	80D69-1①	24R09U ②			PC-8404②	24R09U②	
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT 1.9A									

① Alternate Part #80B60-3.
② Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6500Ω	3-4Ω	79D33-23	26S49	A-3019	AU-604	A-8092	26S49	S-5X	
T3	6500Ω	3-4Ω	79D33-23	26S49	A-3019	AU-604	A-8092	26S49	S-5X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	5 1/4"	PM	6-8Ω	78C150-5①	52A21Z7.2	① Model 771
SP2	5 1/4"	PM	6-8Ω	78C150-5①	52A21Z7.2	② Two used. All Models except Model 771.
SP3	5 1/4"	PM	6-8Ω	78C150-5①	52A21Z7.2	
SP4	5 1/4"	PM	6-8Ω	78C150-5①	52A21Z7.2	
	8"	PM	3-4Ω	78C151-3②	8A31	
	3½"	PM	3-4Ω	78C148-1②		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ADMIRAL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	409C34-1 (Includes Needles)	13TB	Not Req.	26S	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	98C15-1† or 98C95-2†♦	W-103STSS† or W-103STDS†♦	S-71X † or S-71XSD †♦ or S-71XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

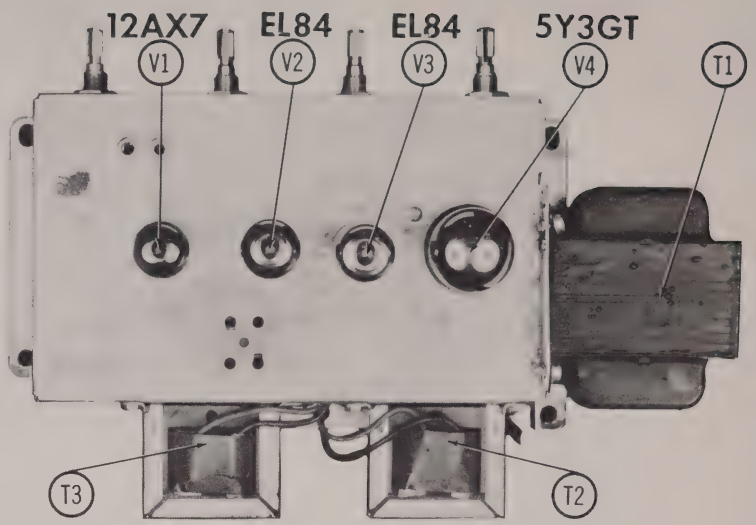
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Switch	77A88-1	Standard-Stereo (Rotary Wafer Type)
M4	Switch	408A1	Off-On-Reject (Part of Changer)
M5	Motor	407C28	Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33C254-16	Loudness, Tone, Balance, All Models Except SS Series.
Knob	403D86-4	Control (Part of Changer)
Cabinet	35E513-2	Model 618
Cabinet	35E513-9	Model 619

CHASSIS—TOP VIEW



CABINETS & CABINET PARTS (cont)

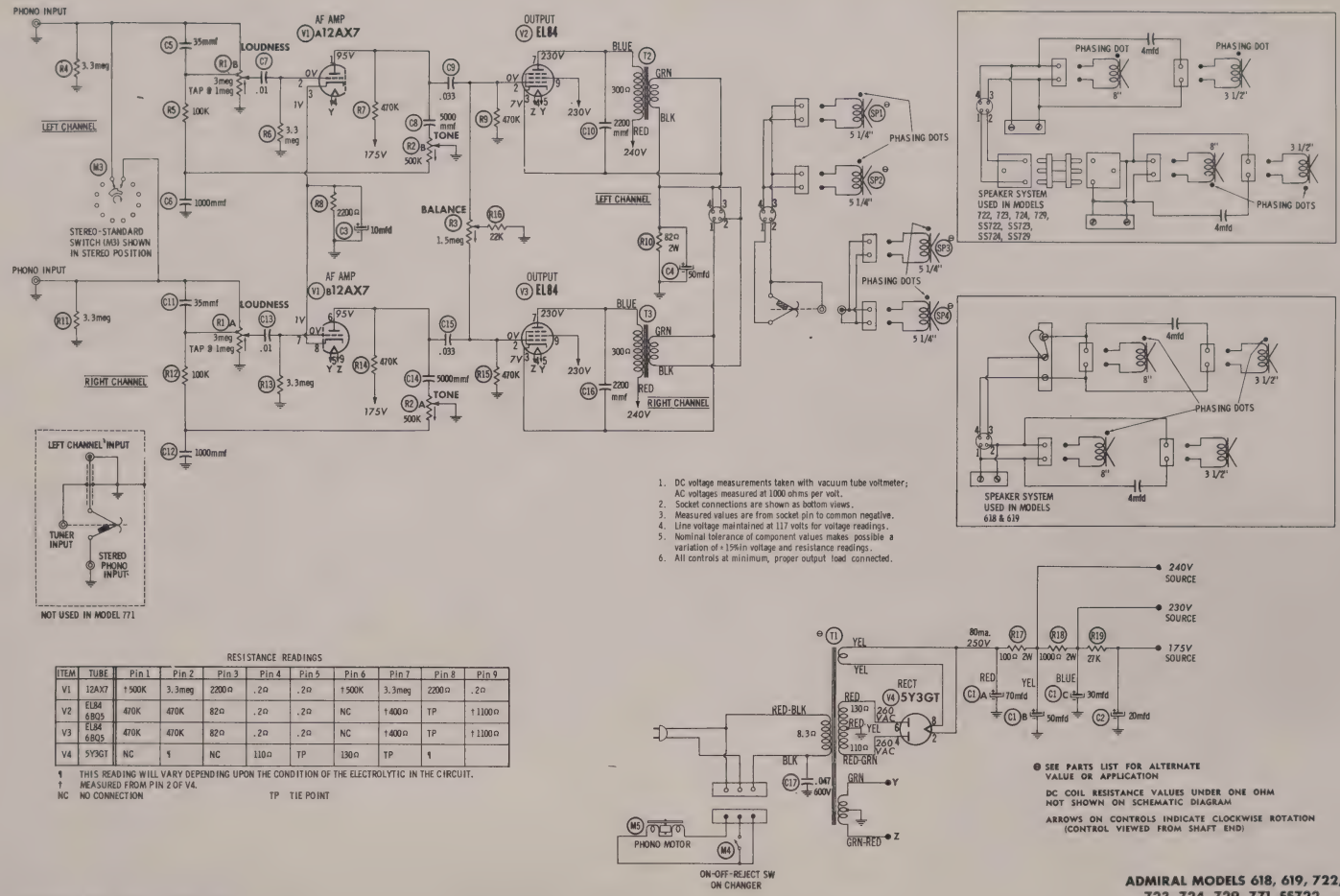
NAME	PART NO.	DESCRIPTION
Cabinet	35E501-2	Model 722
Cabinet	35E501-3	Model 723
Cabinet	35E501-4	Model 724
Cabinet	35E506-9	Model 729
Cabinet	35E502-2	Model SS722
Cabinet	35E502-3	Model SS723
Cabinet	35E502-4	Model SS724
Cabinet	35E507-9	Model SS729
Cabinet	35E510-1	Model 771
Handle	35E510-51	Model 771
Cabinet Leg	37D168-52	Models 722, SS722
Cabinet Leg	37D168-53	Models 723, SS723
Cabinet Leg	37D168-55	Models 724, SS724

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FOLDER 3

ADMIRAL MODELS 618, 619, 722, 723, 724, 729, 771, SS722, SS723, SS724, SS729 (Ch. 4F3)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†500K	3.3meg	2200Ω	.2Ω	.2Ω	†500K	3.3meg	2200Ω	.2Ω
V2	EL84 6BQ5	470K	470K	82Ω	.2Ω	.2Ω	NC	†400Ω	TP	†1100Ω
V3	EL84 6BQ5	470K	470K	82Ω	.2Ω	.2Ω	NC	†400Ω	TP	†1100Ω
V4	5Y3GT	NC	¶	NC	110Ω	TP	130Ω	TP	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 2 OF V4.
NC NO CONNECTION TP TIE POINT

❷ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

ADMIRAL MODELS 618, 619, 722, 723, 724, 729, 771, SS722, SS723, SS724, SS729 (Ch. 4F3)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT® Folder with CIRCUITRACE®

AMERICAN MOTORS MODEL 8990706 (04MA)

TRADE NAME	American Motors Model 8990706 (04MA) (For 1960 Rambler Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	540 — 1610KC RATING 1 Amp. @12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A8, A9, A10..... See Fig. 2.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400% Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Antenna receptacle thru dummy (Fig. 1).	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9 and A10) out of coils. Repeat Step 2.					
3.	Antenna receptacle thru dummy (Fig. 1).	1020KC	Tuning carriage 9/16 from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3 until no further increase is noted.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull out pushbutton.
2. Tune manually to desired station
3. Press button in firmly.
4. Repeat for remaining pushbuttons.

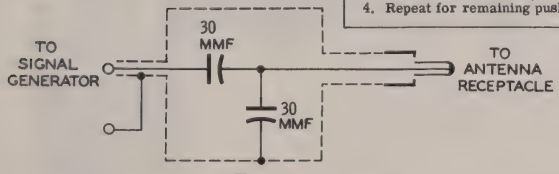

FIG. 1

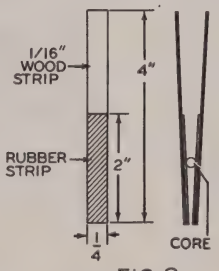

FIG. 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

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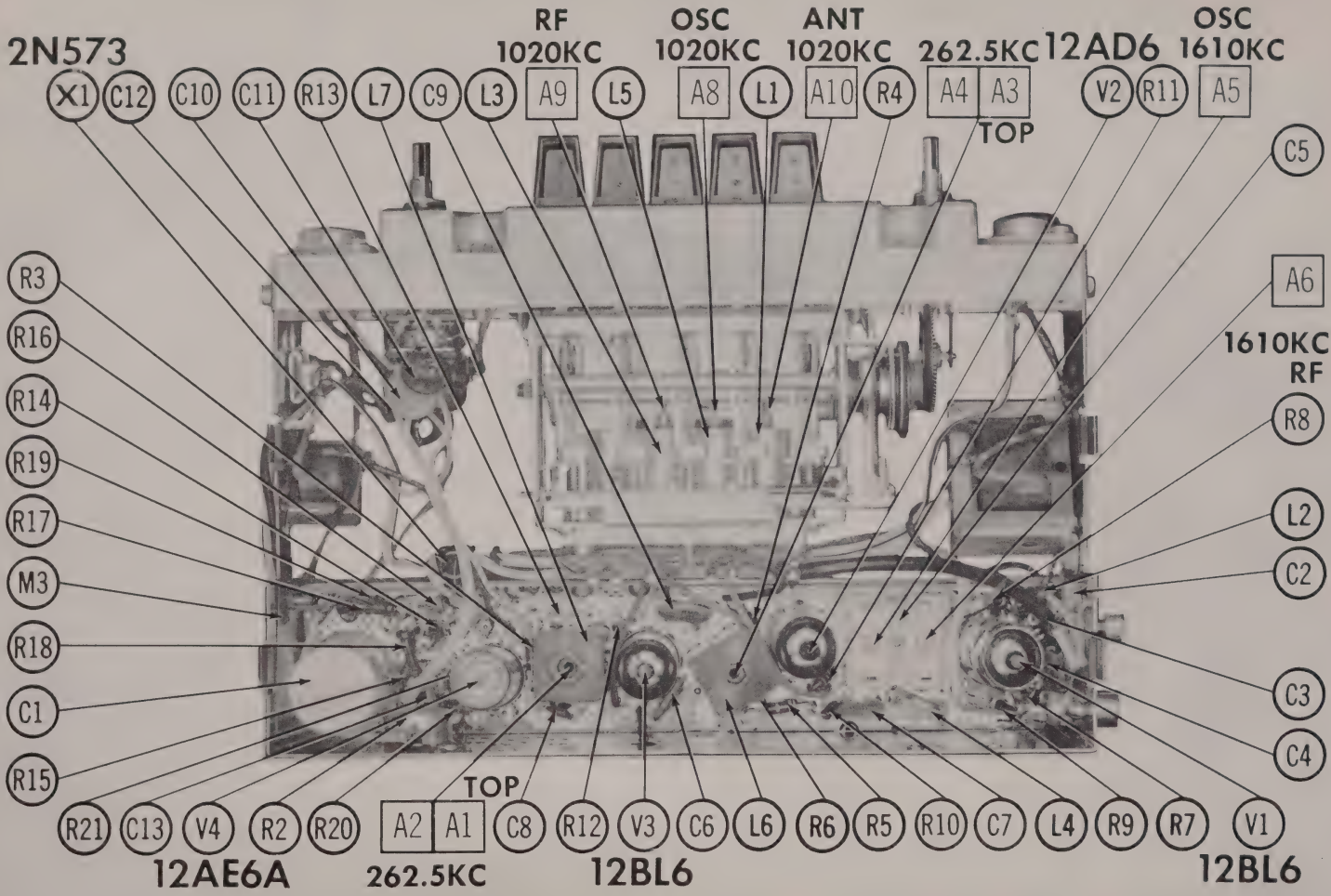
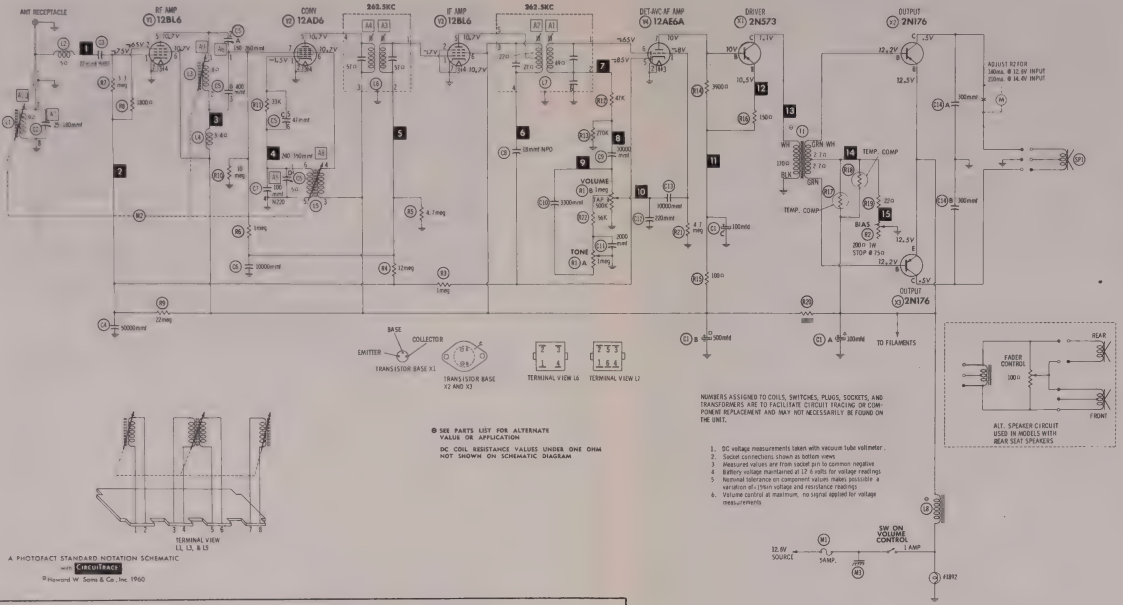
AMERICAN MOTORS MODEL 8990706 (04MA)
AMERICAN MOTORS MODEL 8990706 (04MA)
SET 486 FOLDER 4



CHASSIS-TOP VIEW



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● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

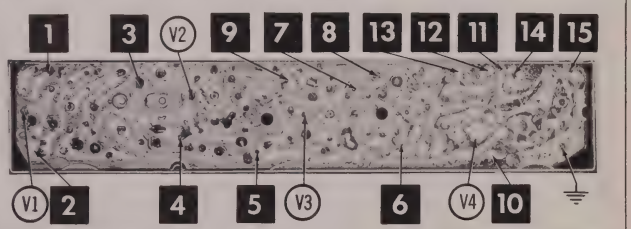
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 12.6 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	13meg	38meg	0Ω	2.4Ω	1.13kΩ	1.13kΩ	0Ω
V2	12AD6	33K	0Ω	0Ω	2.44kΩ	1.16kΩ	1.13kΩ	3.7meg
V3	12BL6	3.5meg	0Ω	0Ω	2.4Ω	1.23kΩ	1.13kΩ	0Ω
V4	12AE6A	4.7meg	0Ω	2.4Ω	0Ω	31meg	33KK	8

1 TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
1 MEASURED FROM JUNCTION OF L8 AND R20.



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PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

AMERICAN MOTORS
MODEL 8990706 (04MA)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det.-AVC-AF Amp.	12AE6A

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver			2N573		PNP
X2	2N176 *	Output	2N399	2N176		2N176	PNP } Matched
X3	2N176 *	Output	2N399	2N176		2N176	PNP } Pair

* When replacing, apply DC-4 grease (Part #1IM490487) or equivalent to each side of the insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲100	16	23B563336	AFH3-00-90	B0045	WP300.8	TMD-109		
B	■500	16			BBR100-25		ML100-25		
C	100	16							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	25-180	#20K539683				460		
C3	27 NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C4	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50
C5A	150-260							
B	400	#20K563443						
C	47							
D	240-350							

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	100 N220	#21R131081				*		10TCR-T10
C8	18 NPO		NPO-DI 20	TCZ-18	C10Q18C	CCTO-180	CNO-418	10TCC-Q18
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D30
C11	2000		BPD-002	DD-202	BYA10D2	CCD-202	GP220	5HK-D20
C12	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14A	300		1468-0003	TCZ-300	5W5T3	CM-19B-301M	MC241	1FM-33
B	300		1468-0003	TCZ-300	5W5T3	CM-19B-301M	MC241	1FM-33

Motorola Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	18K563154	F1-55				Tone
B	1meg	½		R2-60		† QJ-1257A	■ UE4108-S	Volume
	500K Tap							
C	Switch			KR-4				Power Off-On
R2	200Ω	1(WW)	18K560864		39-150 *	115-150*	FL-200 *	Bias
	75Ω Stop							

† "Concentrikit" equivalent: K-8 Kit with base elements & shafts: B11-137, P13-116 (Panel). B19-137X, R1-126 (Rear). R5 (Retainer). 76-1 (Switch)

■ "STA-LOC" equivalent: FB16L, RU16T55, OS1500A, IS1875, US47.
* Use 82Ω series resistor.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	
R4	12meg	
R5	4.7meg	
R6	1meg	
R7	3.3meg	
R8	1800Ω	
R9	22meg	

ITEM No.	RATING	REMARKS
R10	10meg	
R11	33K	
R12	47K	
R13	270K	
R14	3900Ω	
R15	100Ω	
R16	150Ω	

ITEM No.	RATING	REMARKS
R17	Temp. Comp.	#6K542967
R18	Temp. Comp.	#6K542967
R19	22Ω	
R20	100Ω	
R21	4.7meg	
R22	56K	

Motorola Part Number.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	24B563217						
L2	RF Choke	24K563490	19-6033	19-6033				31uh
L3	RF Coil	24B563217						
L4	RF Choke	24K563788	19-7047	19-7047				44uh
L5	Osc. Coil	24B563214						
L6	Input IF Trans.	24K563462	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF Trans.	24D653300						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	.9A	.3Ω	1.1MH	25B563156-B ①						

① Alternate Part #25B563156

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6	1	25C563335-0 ①						

① Alternate Part #25C563335.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9"	PM	18-20Ω	50C562412 *		* Voice coil center tapped.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	1AG	5A 32V	65R122345	9K563134	301005 (1AG 5A 32V)	155004	AGA5	HAF

MISCELLANEOUS

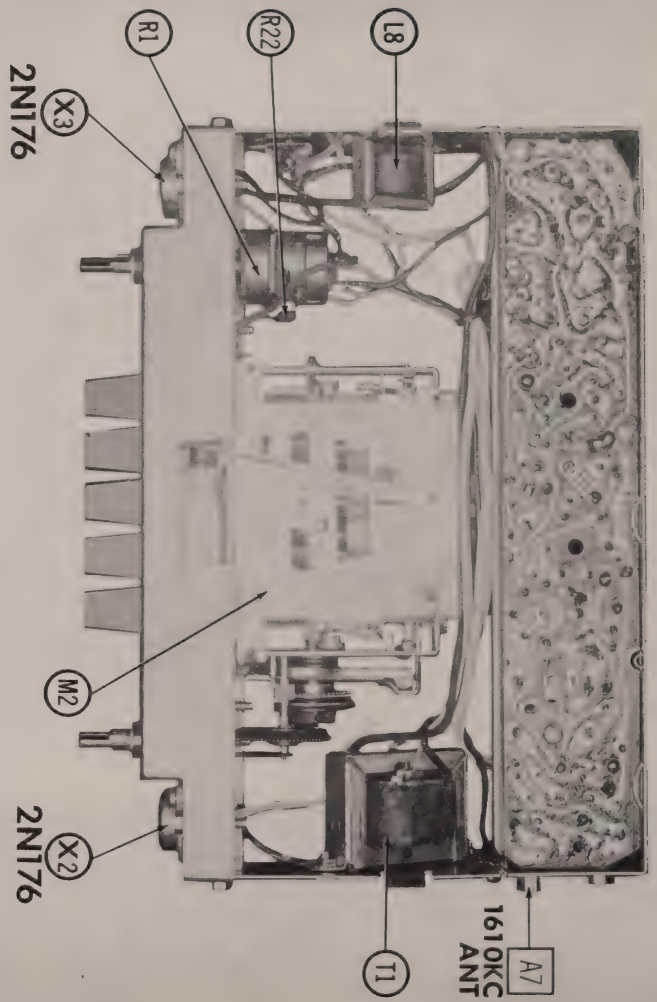
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77E562727	(AT-277) (Complete)
M3	Spark Plate	64K535152	
	Printed Board	84C563466	Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	1A563859	Tuning, Volume
Knob	36K563337	Tone, Dummy
Pushbutton	38B562410	
Pointer	1K562710	
Dial Scale	34C562544	

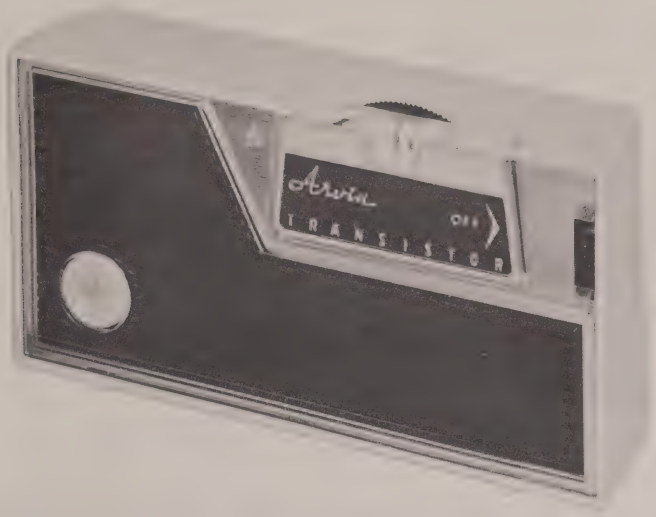
CHASSIS—BOTTOM VIEW



PHOTOFACT® Folder with CIRCUITRACE®

**ARVIN MODEL
9594 (Ch. 1.47500)**

ARVIN MODEL
9594 (Ch. 1.47500)



ARVIN MODEL
9594 (Ch. 1.47500)

TRADE NAME	Arvin Model 9594 (Ch. 1.47500)		
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	5MA@6 Volts DC (No Signal, Min. Volume) 11MA@6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 —1670KC		

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A3..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A5..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

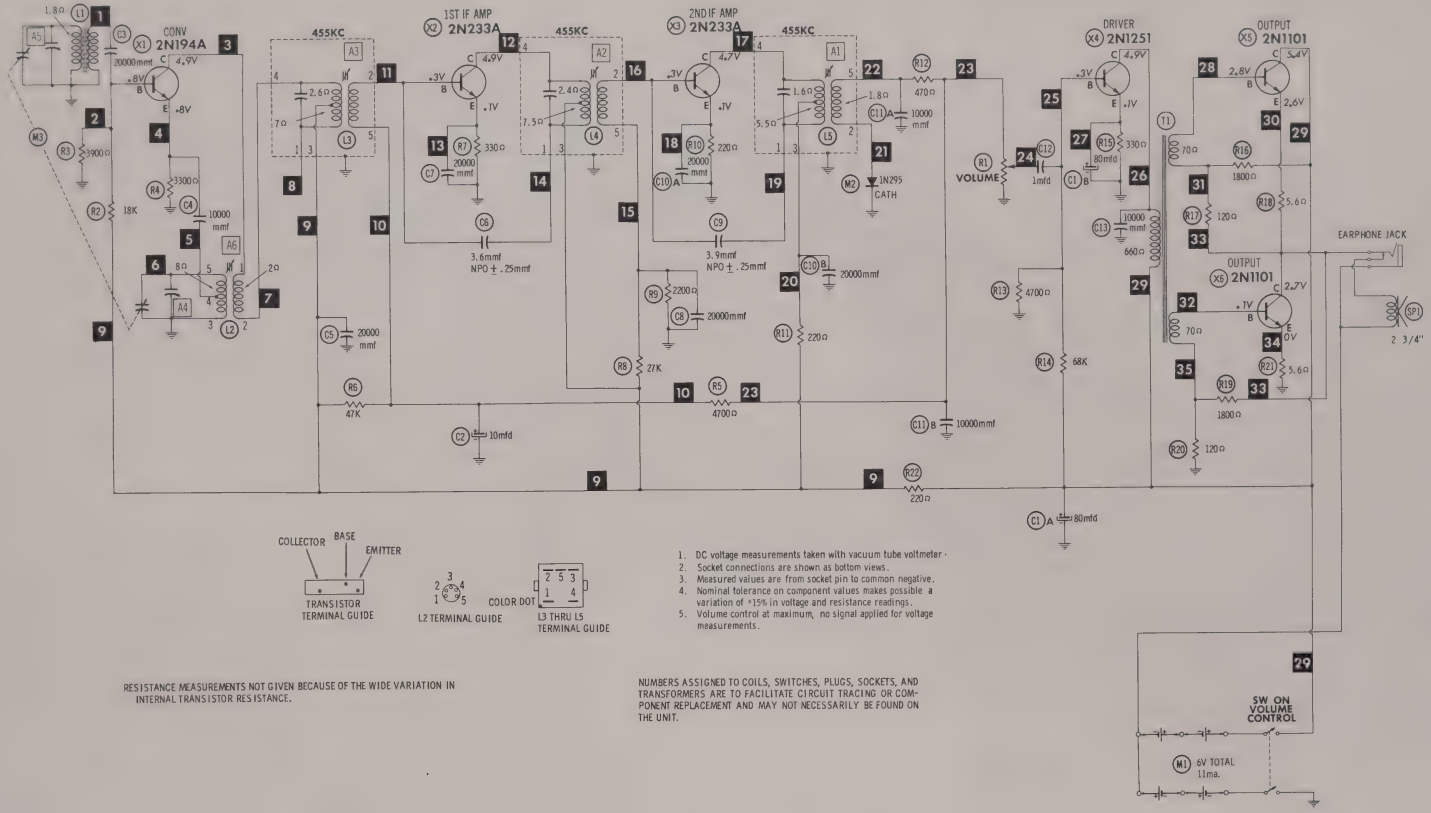
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1670KC	"	"	A4	"
3.	"	1400KC	Tune to 1400KC Signal.	"	A5	"
4.	"	600KC	Tune to 600KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JF742

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 486 FOLDER 5



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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ARVIN MODEL 9594 (Ch. 1.47500)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter	2N438			2N194A	NPN
X2	2N233A	1st IF Amplifier	2N438			2N233A	NPN
X3	2N233A	2nd IF Amplifier	2N438			2N233A	NPN
X4	2N1251	Driver	2N306	2N649		2N306	NPN
X5	2N1101	Output	2N444	2N649		2N1059	NPN } Matched
X6	2N1101	Output	2N444	2N649		2N1059	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	80	12	44397-3		ECPAN14			VL-2350	
B	80	12							
C2	10	10	44396-4	PWE10010	EC10-10	TT12X10	ML10-15	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C6	3.6 NPO ± .25mmf				C10V4C			10TCC-V39
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C9	3.9 NPO ± .25mmf				C10V4C			
C10A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	GP120	5HK-2S20
B	20000			DD-203	BYB6S2	CCD-203	GP120	
C11A	10000		BPD-2X01	DD3-103	BYB6DS1	CCD-103	B2X110	5HK-2S10
B	10000					CCD-103		
C12	1mfd	#44684-9		UK-105				HY135
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

Arvin Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2200Ω	½	46800-4					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	18K	
R3	3900Ω	
R4	3300Ω	
R5	4700Ω	
R6	47K	
R7	330Ω	
R8	27K	

ITEM No.	RATING	REMARKS
R9	2200Ω	
R10	220Ω	
R11	220Ω	
R12	470Ω	
R13	4700Ω	
R14	68K	
R15	330Ω	

ITEM No.	RATING	REMARKS
R16	1800Ω	
R17	120Ω	
R18	5.6Ω	
R19	1800Ω	
R20	120Ω	
R21	5.6Ω	
R22	220Ω	

PRINTED BOARD

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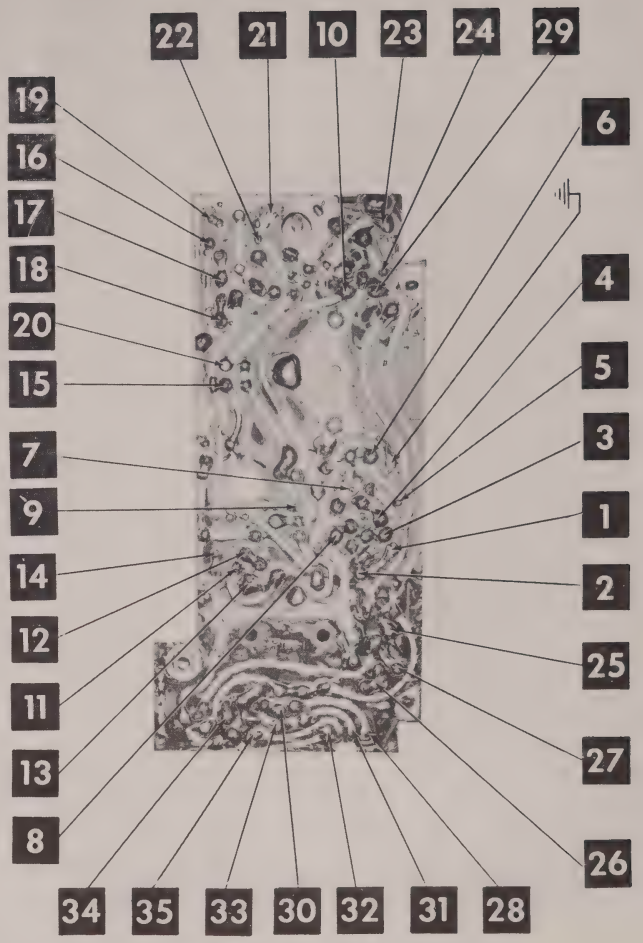


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ARVIN PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	44511-6	14-9005	14-9005				
L2	Osc. Coil	45783-12						
L3	1st IF Trans.	47163-1						
L4	2nd IF Trans.	47163-2						
L5	3rd IF Trans.	47163-3						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3	1	45604-3						
		SEC. 2							
		1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	2 3/4"	PM	45-50Ω	44280-2	27A06Z45	

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930 *		1015 *		M-15R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ARVIN PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	43959	1N295	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap. Printed Board	47431 47159-1	2 Gang

CABINETS & CABINET PARTS

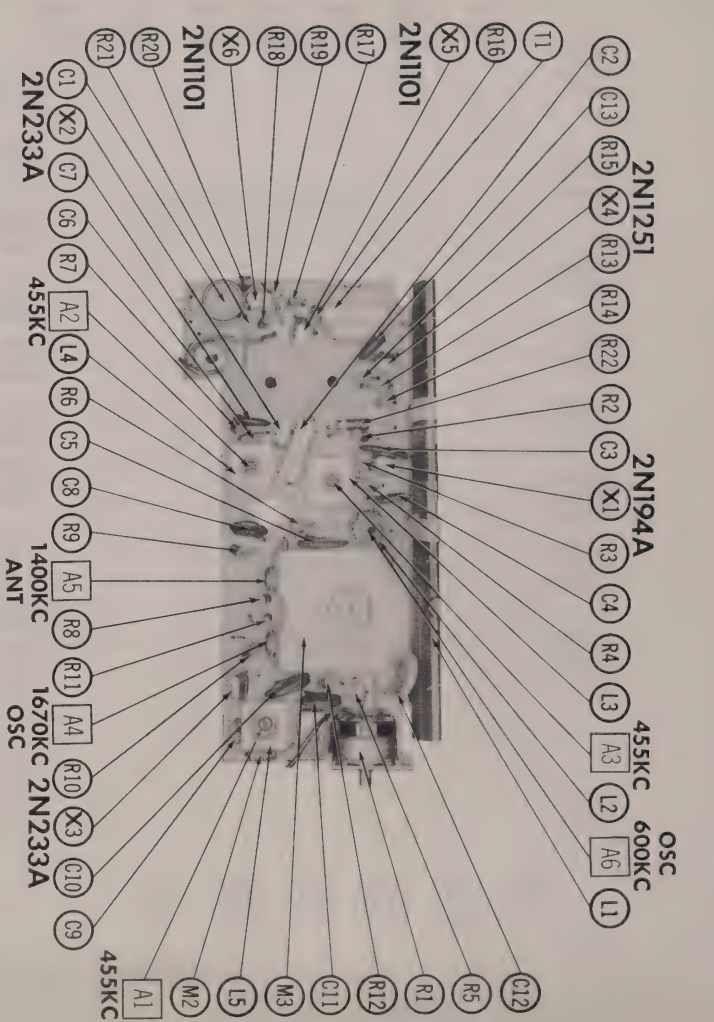
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47427-67	Tuning, White
Knob	47427-29	Tuning, Black
Knob	46658-67	Volume, White
Knob	46658-29	Volume, Black
Cabinet Front	46922	
Cabinet Back	46921-67	White
Cabinet Back	46921-29	Black
Handle	46923-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

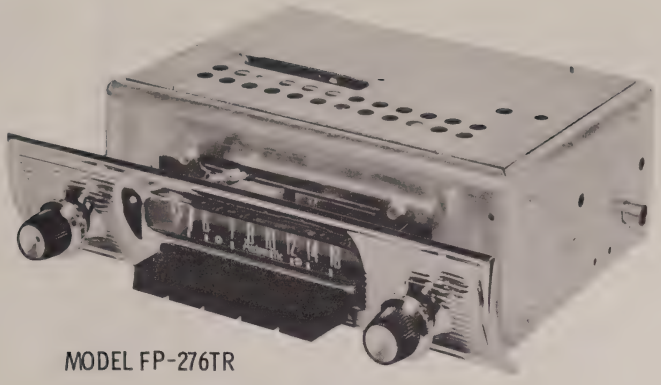
CHASSIS—TOP VIEW



PHOTOFACT® Folder

AUTOMATIC MODELS C-349, CA-109, F-139, FA-219, FP-276TR, L-559, LA-449, LAP-29, LP-929, RT-7D, S-91, SA-529, SP-1, SPA-209

AUTOMATIC MODELS C-349, CA-109, F-139, FA-219, FP-276TR, L-559, LA-449, LAP-29, LP-929, RT-7D, S-91, SA-529, SP-1, SPA-209



MODEL FP-276TR

AUTOMATIC MODELS C-349, CA-109, F-139, FA-219, FP-276TR, L-559, LA-449, LAP-29, LP-929, RT-7D, S-91, SA-529, SP-1, SPA-209

TRADE NAME	Automatic Models C-349, CA-109 (For 1959 Chevrolet) F-139, FA-219, FP-276TR (For 1959 Ford) L-559, LA-449, LAP-29, LP-929 (For 1959 Studebaker Lark) RT-7D (Universal Type) S-91, SA-529, SP-1, SPA-209 (For 1958-1959 Simca Aronde)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube - 1 Transistor Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE	Broadcast 535 -1610KC RATING 1.7 Amp. @12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (for Manual tuning) 265KC (for Pushbutton models) (400∿ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Antenna receptacle thru dummy (Fig 1.)	1610KC	"	"	A5, A6, A7	"
3.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT
1. Tune manually to desired station.
2. Pull pushbutton out. Push in firmly.
3. Repeat for remaining pushbuttons.

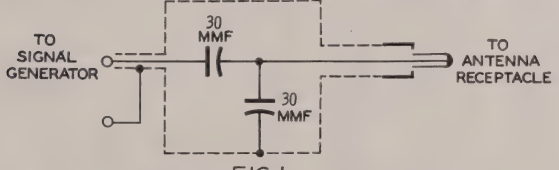


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JD697

SET 486 FOLDER 6

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6 (12AF6) *	V3	IF Amplifier	12BL6 (12AF6) *
V2	Converter	12AD6	V4	Det. -AVC- Driver	12DL8

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	4247 *	Output	2N236A			2N242	PNP Note 1

* Some versions may use CT-4447, 4347 or equivalent in this application.
Note 1. When replacing, apply Silicone Compound between the transistor and chassis.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	15	20-317 ①	AFH3-00-95		WP200.6		TVLS-2157 *	
B	▲500	15							
C2	750	3	20-757	SRE3V500	BR1000-6	PETA190	TD-1000-6	TVAS-1097 *	

① Some versions may use 500-150mfd (Part #20-315).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

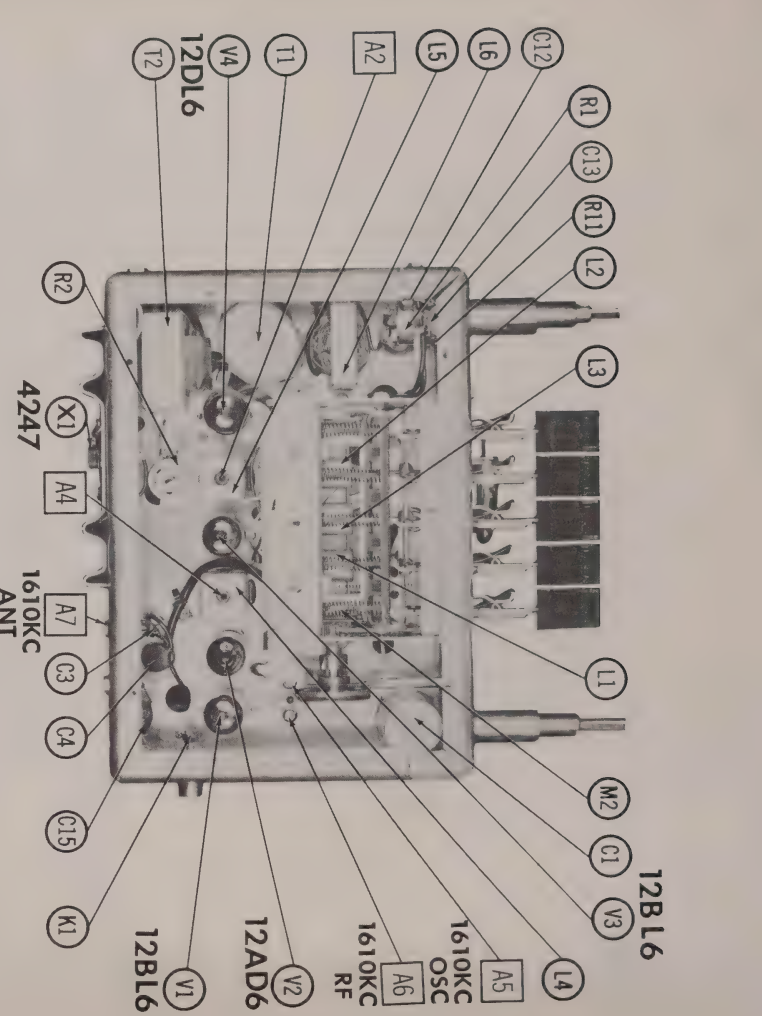
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800K						
C4	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C5	.1 200V	(.047) †	P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C6	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C7	12 NPO			TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C8A								
B		#28-4046						
C	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-Q39	CNO-439	10TCC-Q39
C9	51 N750	(100) †		TCN-51	C10Q51U			
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	27 NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C12	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C15	3000		DI-3000	DD-302	BYA10D3	CCD-302	GP230	5HK-D30

\# Automatic Part Number.
† Alternate Value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		80-266				▲UE4102S	Tone Note 1
B	500K							Volume Note 1
	150K Tap					† QJ-1256A		
C	Switch							Power, Off-On
R1A	2meg		80A6183		RTV-68K			Tone Note 2
B	1meg					‡ QJ-993A	■UE3981-S	Volume Note 2
	650K Tap							
C	Switch							Power Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg		80A663B					Tone Note 3
B	2meg							Volume Note 3
	650K Tap							
C	Switch							Power Off-On
R2	500Ω	2(WW)	62-501		39-500-100	112-500-100	FL-600S	Bias
	100Ω Stop							

Note 1. Models C-349, CA-109 use 2meg Tone, 1meg volume. (Part #80A1070).
Models S-91, SP-1, SA-529, SPA-209 use 2meg Tone, 1meg Volume. (Part #80A1190).
Note 2. Used in Models F-139, FA-219, FP-276TR
Note 3. Used in Models L-559, LA-449, LP-929, LAP-29.
▲ "STA-LOC" equivalent: FV26A, RU16T154, OS2125, IS2625, US41.
■ "STA-LOC" equivalent: FL26A, RU16T654, OS1937, IS2375, US41.
† "Concentrikit" equivalent: K-8 Kit with base elements and shafts: Bl3-139, Pl4-202 (Panel). Bl3-133X, Rl-216 (Rear). 76-1 (Switch). S9 (Bushing)
‡ "Concentrikit" equivalent: K-8 Kit with base elements and shafts: Bl3-139, Pl3-128 (Panel) Bl9-137X, Rl-207 (Rear) 76-1 (Switch) S-50 (Bushing)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1.2meg	
R4	150K	
R5	1500Ω	
R6	4.7meg	
R7	2.2meg	

ITEM No.	RATING	REMARKS
R8	47K	
R9	10meg	
R10	10meg	
R11	100K	
R12	3.3meg	

ITEM No.	RATING	REMARKS
R13	560Ω	(330Ω) *
R14	22Ω	
R15	1Ω 2W	
R16	47Ω	(68Ω) *
R17	47K	

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

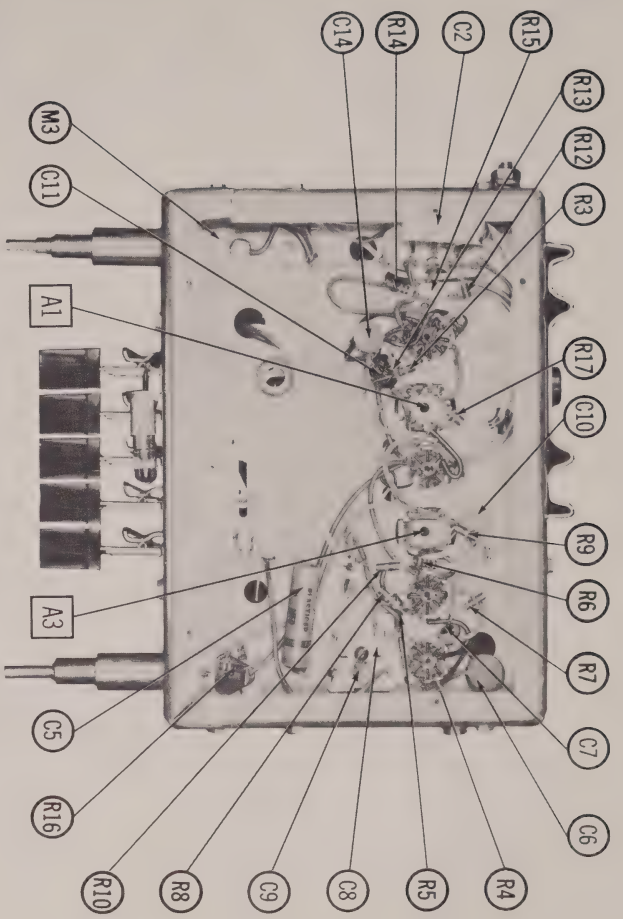
ITEM No.	USE	REPLACEMENT DATA						NOTES
		AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil							
L2	RF Coil							
L3	Osc. Coil							
L4	Input IF Trans.	14-265①	16-6752	16-6752	BC-350	12-H1	RF-3	
L5	Output IF Trans.	14-267①	16-6754	16-6754	BC-354	12-H6		

① Part #14-1655-6/X used in manual tuning models.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L6	1.7A	.9Ω	.008HY	75A601						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5	1	75-459						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
		AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	14Ω Tap ⓐ 3-4Ω	75A966 ①							

① Part #75-966 may be used in all models.
Part #75-460 may be used in Models L-559, LP-929, LA-449, LAP-29, C-349, CA-109.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	6"X 9"	PM	3-4Ω	73B902	69A3	Models F-139, FA-219, FP-276TR
	4"x 8"	PM	3-4Ω	73-1170		Models L-559, LP-929, LA-449, LAP-29
	2"x 10"	PM	3-4Ω	73-969		Models S-91, SP-1, SA-529, SPA-209
	6"x 9"	PM	3-4Ω	73B1083		Models C-349, CA-109

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V			307007.5	155009	SFE 7½	HHH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2	Tuner	78B1061 (or) 78B1062	Pushbutton Type, Models F-139, FA-219, FP-276TR
	Tuner	78A915	Manual, Models F-139, FA-219, FP-276TR
	Tuner	78B1191	Pushbutton Models S-91, SP-1, SA-529, SPA-209
	Tuner	78B1205	Manual, Models S-91, SP-1, SA-529, SPA-209
	Tuner	78A846	Pushbutton, Models L-559, LP-929, LA-449, LAP-29
	Tuner	78A858A	Manual, Models L-559, LP-929, LA-449, LAP-29
	Tuner	78A1089	Manual, Models C-349, CA-109
M3	Spark Plate		

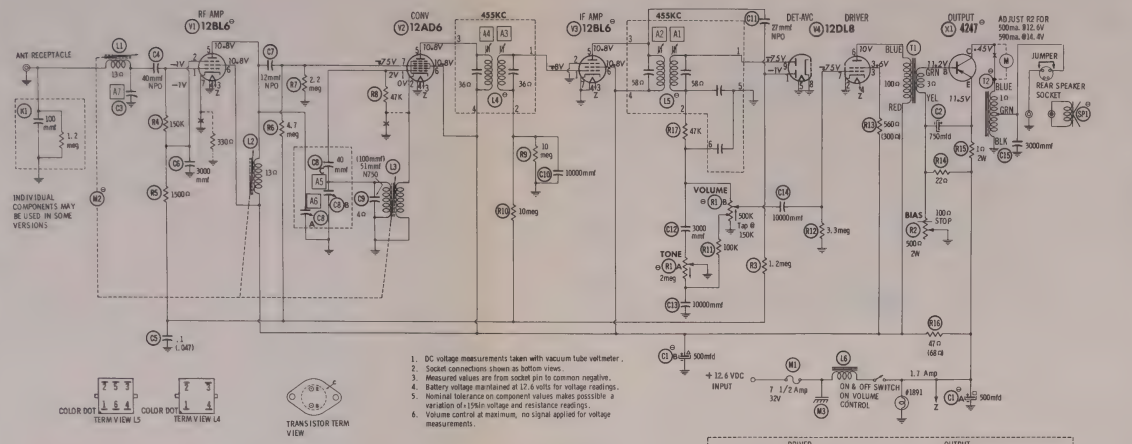
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47-A617	Control, Models F-139, FA-219, FP-276TR
Knob	47B319-2W	Control, Models S-91, SP-1, SA-529, SPA-209
Knob	48A889	Tuning-Volume, Models L-559, LP-929, LA-449, LAP-29
Knob	48A1069	Tuning-Tone, Models C-349, CA-109
Knob	48B393	Tone, Models F-139, FA-219, FP-276TR
Knob	47B393	Tone, Models S-91, SP-1, SA-529, SPA-209
Knob	47A891	Tone, Models L-559, LP-929, LA-449, LAP-29
Knob	48A1063	Tone-Dummy, Models C-349, CA-109
Knob	48B393-1	Dummy, Models F-139, FA-219, FP-276TR
Knob	47B393-1	Dummy, Models S-91, SA-529, SPA-209, SP-1
Knob	47A891-1	Dummy, Models L-559, LP-929, LA-449, LAP-29
Dial Scale	39A575-1	Models, S-91, SP-1, SA-529, SPA-209

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

STEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	6.3meg	6.2meg	1.5Ω	0Ω	†60Ω	†47Ω	0Ω		
V2	12AD6	47K	9Ω	0Ω	1.5Ω	†80Ω	†47Ω	2meg		
V3	12BL6	8meg	0Ω	0Ω	1.5Ω	†105Ω	†47Ω	0Ω		
V4	12DL8	7.2meg	0Ω	†600Ω	1.5Ω	0Ω	†150Ω	3.3meg	0Ω	500K

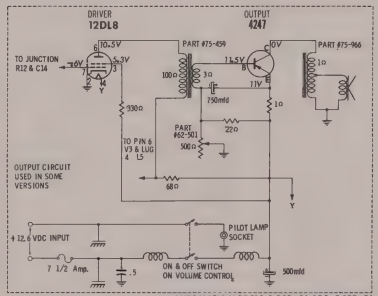
† MEASURED FROM JUNCTION OF R16 AND C1A
TRANSISTOR RESISTANCE NOT GIVEN ON X1 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OF COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AUTOMATIC MODELS C-349, CA-109, F-139, FA-219, FP-276TR, L-559, LA-449, LAP-29, LP-929, RT-7D, S-91, SA-529, SP-1, SPA-209

PHOTOFACT® Folder

CORONADO MODEL RA48-9905A

CORONADO MODEL RA48-9905A

CORONADO MODEL RA48-9905A

TRADE NAME	Coronado Model RA48-9905A
SUPPLIER	Gamble-Skogmo, Inc., 15 North Third Street, Minneapolis, Minn.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	8MA @ 9 Volts DC (No Signal, Min. Volume) 13MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2, A3..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A4, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A5..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side to Base of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	1650KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	540KC	Tuning gang fully closed.	"	A5	"
4.	"	1400KC	Tune to 1400KC signal.	"	A6	"
5.	"	600KC	Tune to 600KC signal.	"		Retouch A5 for maximum output while rocking tuning gang. Repeat Steps 4 and 5.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JF656

SET 486 FOLDER 7

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N486	Converter		2N175	2N486		PNP
X2	2N483	1st IF Amplifier		2N139	2N483	2N139	PNP
X3	CK879	Overload			CK879		PNP
X4	2N482	2nd IF Amplifier		2N139	2N482	2N139	PNP
X5	CK879	Detector			CK879		PNP
X6	2N632 *	Driver		2N406	2N362	2N406	PNP
X7	2N632	Output		2N408	2N632	2N408	PNP } Matched
X8	2N632	Output		2N408	2N632	2N408	PNP } Pair

* Alternate type 2N362.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	100	10	150-150		ECPAP7		TDLD-15		
B	100	10							
C2	10	10		XPP-10010	NLW19-10	TT12X10	ML10-15	TE-1114	Note 1
C3	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	Note 1
C4	50	10	150-130	XPP-10050	NLW50-10	TT10X50	ML50-15	TE-1119	

Note 1. Some versions may use 12mfd in this application (Part #150-132).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C6	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C7	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C8	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C9	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C10	7.5 NPO 5%	#158-118			C10V8C			
C11	.1 200V		P288N-1	DF-104	CUB2P1	2D1-3-104	GEM-201	2TM-P1
C12	5.24 NPO 5%		NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C16	10 N750 10%		N750-S1 10	TCN-10	C10-Q1U	CCTN-100	CN7-410	10TCU-Q10

\# Coronado Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	10K	½	120-161	B-15	A47-10K-Z	Q13-116	U-18	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-4	SWE-13	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

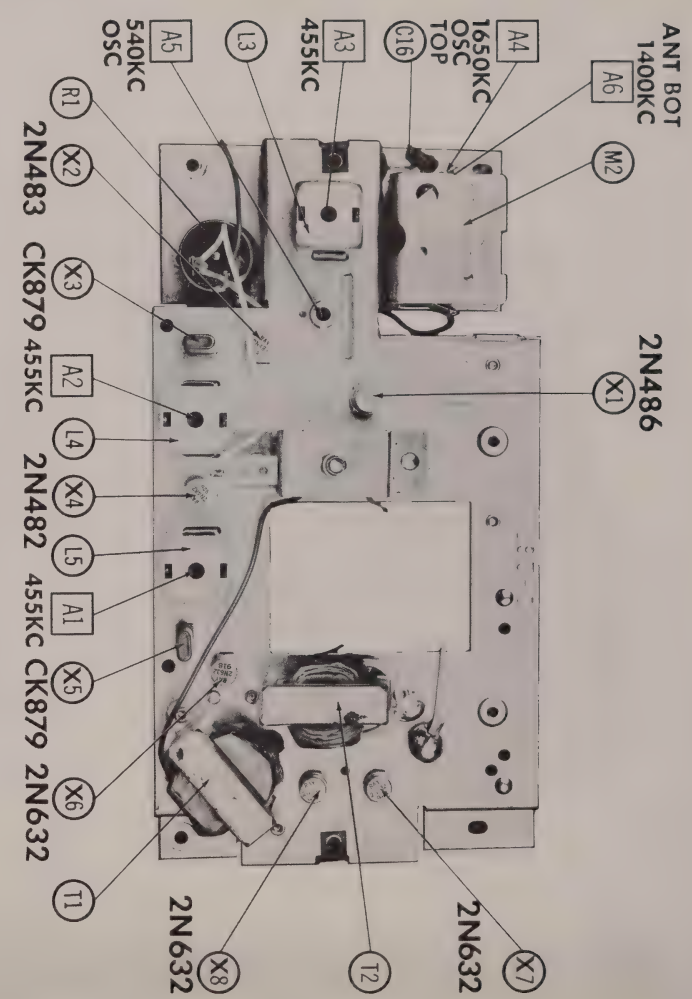
ITEM No.	RATING	REMARKS
R2	18K	
R3	6800Ω 5%	
R4	3900Ω	
R5	680Ω	
R6	560Ω 5%	
R7	2200Ω	(1500Ω) *

ITEM No.	RATING	REMARKS
R8	330Ω 5%	
R9	15K	
R10	220K	
R11	68K 5% *	
R12	10K	(8200Ω) *
R13	1000Ω	(680Ω) *

ITEM No.	RATING	REMARKS
R14	8200Ω 5%	
R15	150Ω 5%	
R16	10Ω	
R17	10Ω	
R18	220K	
R19	560Ω	

* Alternate Value.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		CORONADO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	132-145A						
L2	Osc. Coil	136-144A						
L3	1st IF Trans.	130-136						
L4	2nd IF Trans.	130-137						
L5	3rd IF Trans.	130-138						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	138-142						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	CORONADO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	320Ω CT	3-4Ω	138-143							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω		46A1	

BATTERIES

ITEM No.	VOLTAGE	CORONADO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	B17-402 *		1 *		635 *		M-14R *	* 6 Required

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M2	Tuning Cap.	160-135B	2 Gang (Ant. 24-272mmf, Osc. 23-125mmf)

CABINETS & CABINET PARTS

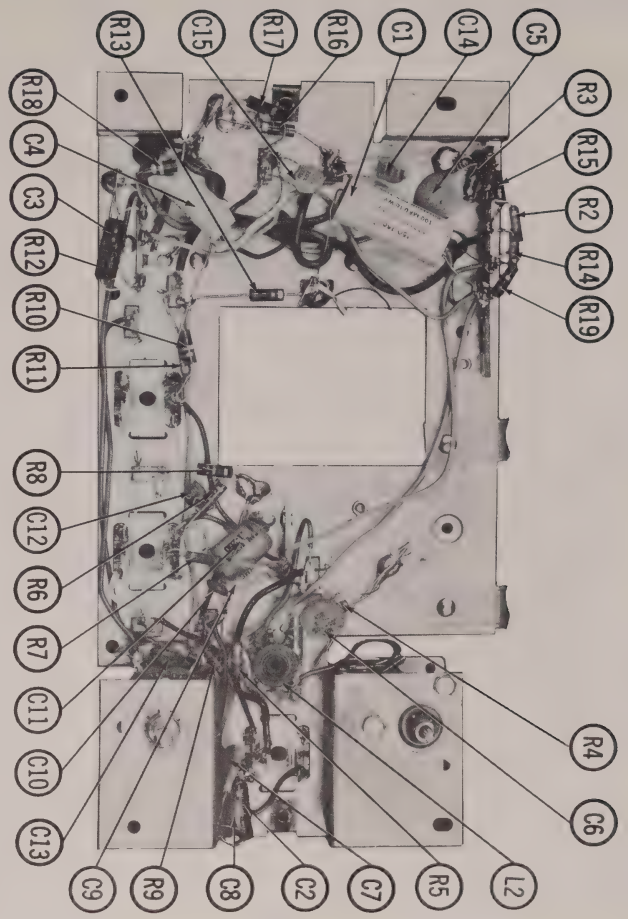
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

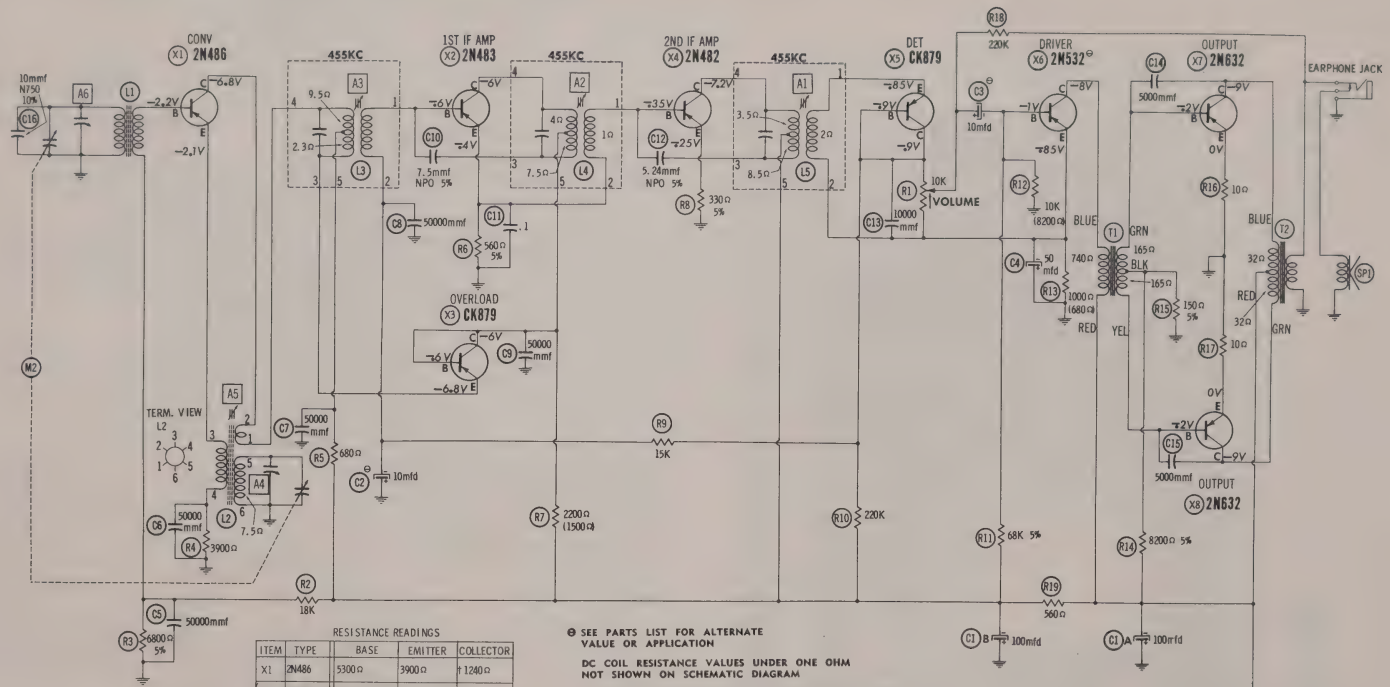
NAME	PART NO.	DESCRIPTION
Knob	220-160	Tuning
Knob	220-178	Volume
Knob	220-180B	Calibration Disc W/ A
Cabinet Shell	210-167E	
Handle	146-134	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

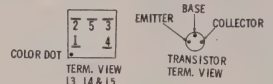
ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N486	5300Ω	3900Ω	†1240Ω
X2	2N483	25K	560Ω	†2760Ω
X3	CK879	†2760Ω	†2760Ω	†1240Ω
X4	2N482	560Ω	330Ω	†560Ω
X5	CK879	11K	1000Ω	11K
X6	2N632	10K	1000Ω	†740Ω
X7	2N632	315Ω	10Ω	†32Ω
X8	2N632	315Ω	10Ω	†32Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R19 AND C1A.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CORONADO MODEL RA48-9905A

PHOTOFACT® Folder

**CURTIS MATHES
MODEL 315MS**

CURTIS MATHES
MODEL 315MS

CURTIS MATHES
MODEL 315MS

TRADE NAME	Curtis Mathes Model 315MS
MANUFACTURER	Curtis Mathes Manufacturing Co., 2220 Young Street, Dallas, Texas
TYPE SET	AC Operated 6 Tube AM Receiver with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 33 Watts, .36 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1201 - PHOTOFACT SET 438 FOLDER 18.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
With tuning gang fully closed set pointer on arrow at left end of dial.
Suggested Alignment Tools: A1 thru A4. . . . GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1400KC	1400KC	"	A5	"
3.	Loop	"	"	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JP688

SET 486 FOLDER 8

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amp.	12BA6
V3	AVC-Det. -AF Amp.	12AV6
V4	Phase Inv.	12AV6
V5	Output	35C5
V6	Output	35C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150		AFH2-19	XB0181	FP216	TMD-17	TVL-2442.1	
B	▲50	150							
C2	2	25 NP	①	PRS7300	BBR4-50 †	TCN502		TVAS-1202 *	

① Some versions may use 6mfd in this application.
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
*Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C6	100 N150					*		10TCP-T10
C7	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C8	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C9	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C10	.033 200V		P288N-033	DD-303	CUB4S33	4DP-2-333	GEM-4133	4TM-S33
C11	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C12	.0039 400V 10%		V84C6D4-10%		PM6D4	6DP-1-392	GEM-1624	6TM-D4
C13	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C14	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C15	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C16	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C17	220	(1000mmf) †	DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C18	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C19	.1 600V		P688N-1	D6-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C20	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

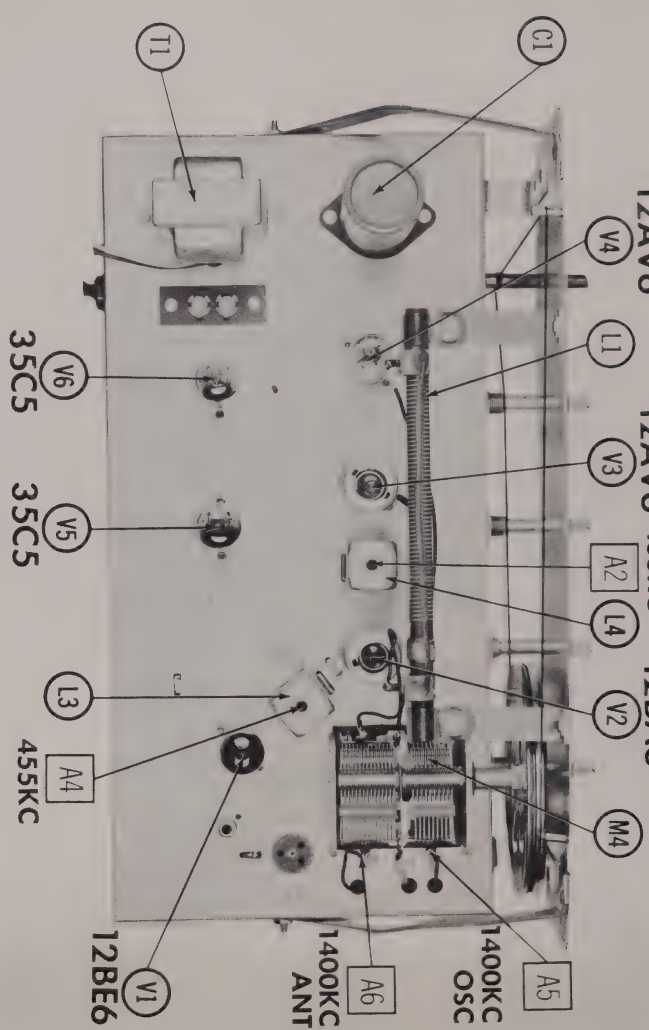
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Alternate value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.5meg*	½	2A1	BT-167		Q18-139XX	UDT-291	Loudness
B	Shaft			Not Req.		Not Req.	Not Req.	
R2A	1meg	½	2A2	B-70	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	1meg	½	2A3	B-70-S	A47-1meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	KSS-3	NotReq.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

* Taps ② 200K and 500K.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	2.2meg	
R5	100Ω	
R6	22K	
R7	68Ω	
R8	470K	
R9	120K	
R10	6.8meg	

♦ Curtis Mathes Part No.

ITEM No.	RATING	REMARKS
R11	100K	
R12	12K	
R13	470Ω	
R14	68K	
R15	470K	
R16	15K	
R17	82Ω 1W	

ITEM No.	RATING	REMARKS
R18	15meg	
R19	470K	
R20	33Ω 5W	#8A2
R21	1000Ω 2W	
R22	100K	
R23	220K	
R24	220K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Curtis Mathes PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	1A6			BC-419			
L2	Osc. Coil	1A1			BC-393	71-OSC		
L3	Input IF Trans.	1A7	16-6758	16-6758	BC-352	12-C1	RF-1	
L4	Output IF Trans.	1A8	16-6770	16-6770	BC-355	12-C6		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Curtis Mathes PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2300Ω CT	3-4Ω	10A5 ①	24S07②	A-2901 ②	AU-600②	A-3823②	24S07 ②	S-53X ②	①Alternate Part #10A2. ②Use original frame.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Curtis Mathes PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω		8A1	
SP2	6"	PM	3-4Ω		6A1	
SP3	3½"	PM	10-12Ω		3A07Z11.8	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Curtis Mathes PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.090A	A750 *	SD-94 *	HF154 *	M150 *	SR200 *	* Silicon Type.

PHONO CARTRIDGE

ITEM No.	♦	REPLACEMENT DATA							
	Curtis Mathes PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		81TB	81-T1 81-1	36T				2T-S	N2T-S

PHONO NEEDLE

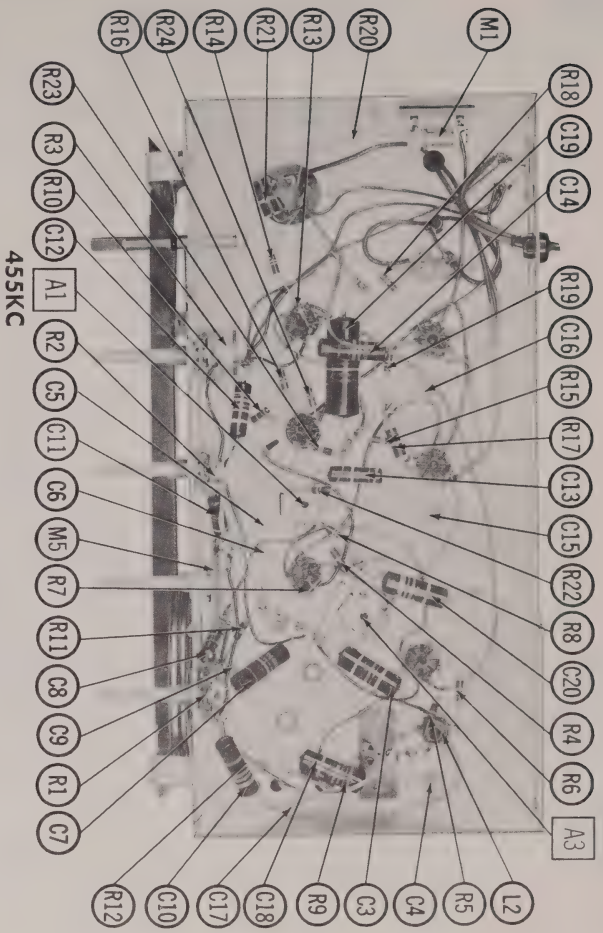
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

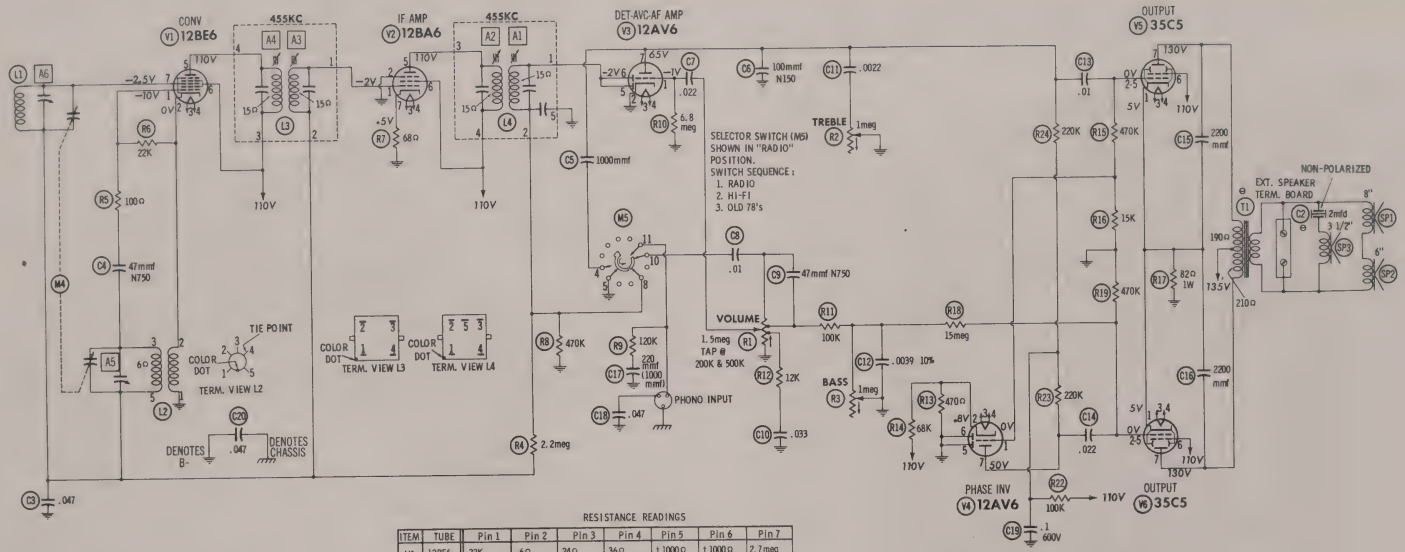
ITEM No.	REPLACEMENT DATA			REMARKS	
	Curtis Mathes PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M3		W-75TPS † or W-75DS †♦ or W-75TPD♦	S-66 † or S-66SD †♦ or S-66D ♦	† Jewel	♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M4	Tuning Cap.		2 Gang (Ant. 42-525mmf, Osc. 22-140mmf)
M5	Switch	6A2	Selector

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.6Ω	24Ω	36Ω	†1000Ω	†1000Ω	2.7meg
V2	12BA6	2.7meg	0Ω	36Ω	48Ω	†1000Ω	†1000Ω	68Ω
V3	12AV6	6.8meg	0Ω	0Ω	12Ω	470K	470K	†320K
V4	12AV6	15K	470Ω	12Ω	24Ω	0Ω	0Ω	†320K
V5	35C5	82Ω	485K	48Ω	83Ω	485K	†1000Ω	†220Ω
V6	35C5	82Ω	470K	83Ω	118Ω	470K	†1000Ω	†240Ω

† MEASURED FROM OUTPUT OF M1.

SWITCH ON CHANGER

PHONO MOTOR

ON-OFF SWITCH ON BASS CONTROL

PHONO MOTOR SOCKET

135V SOURCE

110V SOURCE

140V 90ma. 33Ω 5W

1000Ω 2W

C1A 80mfd

C1B 50mfd

82VAC 48VAC 36VAC 24VAC 12VAC

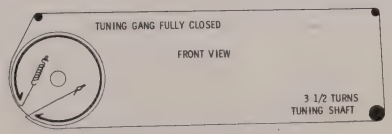
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.



DIAL CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CURTIS MATHES MODEL 315MS

PHOTOFACT® Folder

**EICO MODEL
HF-65A**

EICO MODEL
HF-65A

EICO MODEL
HF-65A

TRADE NAME	Eico Model HF-65A
MANUFACTURER	Electronic Instruments Co., Inc., 33-00 Northern Blvd., Long Island City 1, N. Y.
TYPE SET	Externally Powered Three Tube Preamplifier

SET 486 FOLDER 9

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JW631

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆			◆ RAYTHEON ◆ SYLVANIA ◆		
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1 V2	Preamplifier AF Amplifier	ECC83/12AX7 ECC83/12AX7	V3	AF Amplifier - Cathode Follower	ECC83/12AX7

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA EICO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	●20	400	24005					TVLS-3673.7*	
B	■40	350							
C	▲40	350							
C2	50	150	23015	PRS1480	BR5015	TC49	TD-50-150	TVA-1414	
C3	25	6	23020	XPP-6025	NLW25-6	TT6X25	TD-25-25	TE-1091	
C4	10	6	23014	XPP-6010	NLW10-6	TT6X10	ML10-6	TE-1087	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

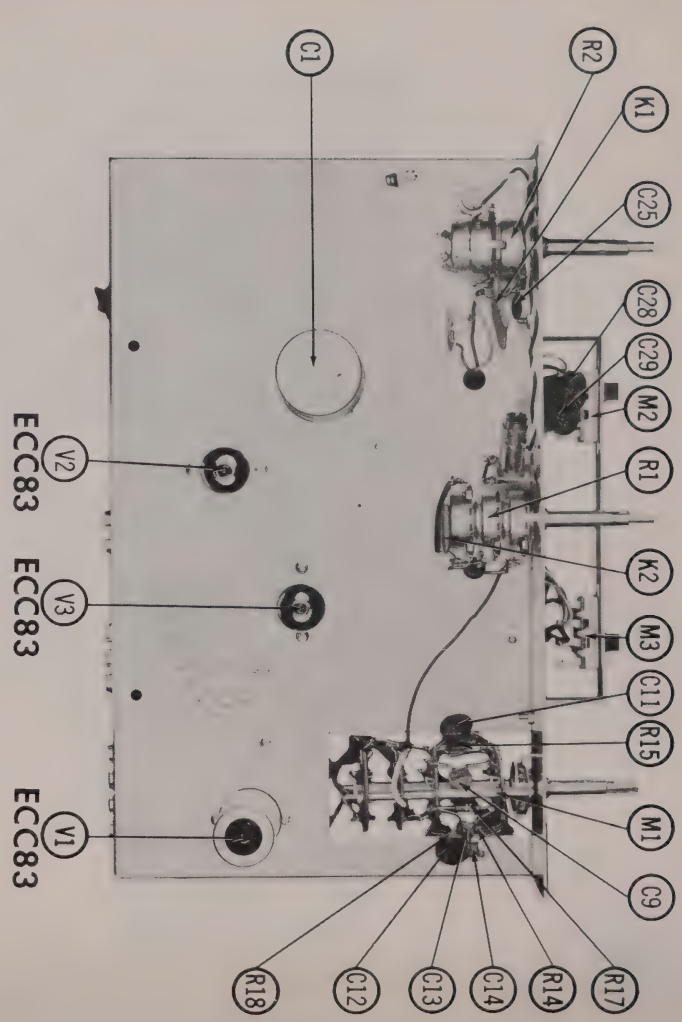
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C6	.25 200V		P288N-25		CUB2P25	2DP-4-254	GEM-2025	2TM-P25
C7	1200 10%		DI-1200	DD-122	1R5D12	CCD-122	GP212	10TS-D12
C8	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C9	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C10	600 10%			DD-601	1R5T6	CCS-621	GP360	10TS-T60
C11	2700 10%		DI-2700		1R5T27	CCD-272	GEM-1623	10TS-D27
C12	3300 10%		DI-3300		PM6D33	CCD-332	JL-333	10TS-D33
C13	100 10%		DI-100	DD-101	L10T10	CCD-101	GP310	10TS-T10
C14	820 10%		DI-820	DD-820	1R5T82	CCD-821	GP382	10TS-T82
C15	500 10%		DI-500	DD-501	5R5T5	CCD-501	GP350	10TS-T50
C16	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C17	.022 600V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C19	20000		BPD-02	DD-203	BYB6S2	CCD-203	GEM-120	5HK-S20
C20	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C21	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C22	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C23	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C24	10000 10%		DI-10000		PM6S1	CCD-103	GEM-1611	10TS-S10
C25	600 10%			DD-601	1R5T6	CCS-621	GP360	10TS-T60
C26	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C27	15000		BPD-015	DD-153	BYA10S15	CCD-153	GP115	5HK-S15
C28	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C29	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C30	25000				ST6S25	6DP-3-253	GEM-6125	5HK-S25
C31	.25 400V		P488N-25		CUB4P25	4DP-5-254	GEM-4025	4TM-P25

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA EICO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		18037					Level
B	100K							Level
C	500K *							Loudness
R2A	1meg		18036	F1-51				Bass
B	500K			R4-42		† QJ-1253R	■ UE4095-S	Treble
C	250K tap Switch			KR-1				Power Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EICO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R3A B	100Ω Shaft	2WW	19009	WN-101 Not Req.	A43-100 FKS-1/4	W11-084 SK5	R100L Not Req.	Hum Adjust

* Taps @ 200K and 350K.

† "Concentrikit" Equivalent: K-15 Kit with base elements and shafts: B11-137, P14-118,(Panel)
Not available as a factory assembled unit. B19-133X, R1-130 (Rear)
76-1 (Switch)

■ "STA-LOC" Equivalent: FA16L, RU55T254, OS1562A, IS2000, US4L.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	220K	
R5	150K	
R6	150K	
R7	10K	
R8	1meg	
R9	200K 5%	
R10	2200Ω	
R11	1meg	
R12	200K 5%	
R13	4700Ω	
R14	100K 5%	
R15	2.2meg 5%	

ITEM No.	RATING	REMARKS
R16	100K 5%	
R17	100K	
R18	560K 5%	
R19	68K 5%	
R20	100K 5%	
R21	220K	
R22	2200Ω	
R23	220K	
R24	100K	
R25	2200Ω	
R26	33K	
R27	470K	

ITEM No.	RATING	REMARKS
R28	100K	
R29	1000Ω	
R30	1meg	
R31	1000Ω	
R32	68K	
R33	470K	
R34	10K 1W	
R35	68K	
R36	22K	
R37	150K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EICO PART No.	REPLACEMENT DATA
K1	Tone Compensator	330mmf, (2) 4700mmf, 1000Ω, (2) 100K, 120K	29751	Aerovox PA-694 Centralab PC-342
K2	Level Compensator	100mmf, 200mmf, 4500mmf, 4500mmf, 50K, 50K	29750	Aerovox PA-682 Centralab PC-324 Sprague TC-4

MISCELLANEOUS

ITEM No.	PART NAME	EICO PART No.	NOTES
M1	Switch	60050	Input Selector (Rotary Wafer Type)
M2	Switch	62005	Rumble Filter (Slide Type, 2 Pole, 3 Position)
M3	Switch	62005	Scratch Filter (Slide Type, 2 Pole, 3 Position)

CABINETS & CABINET PARTS

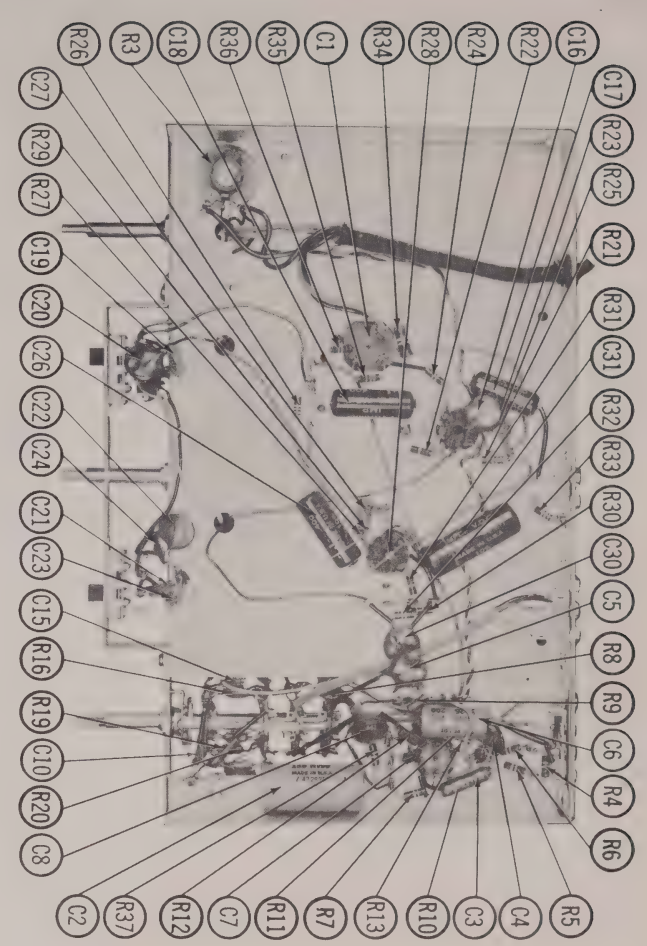
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

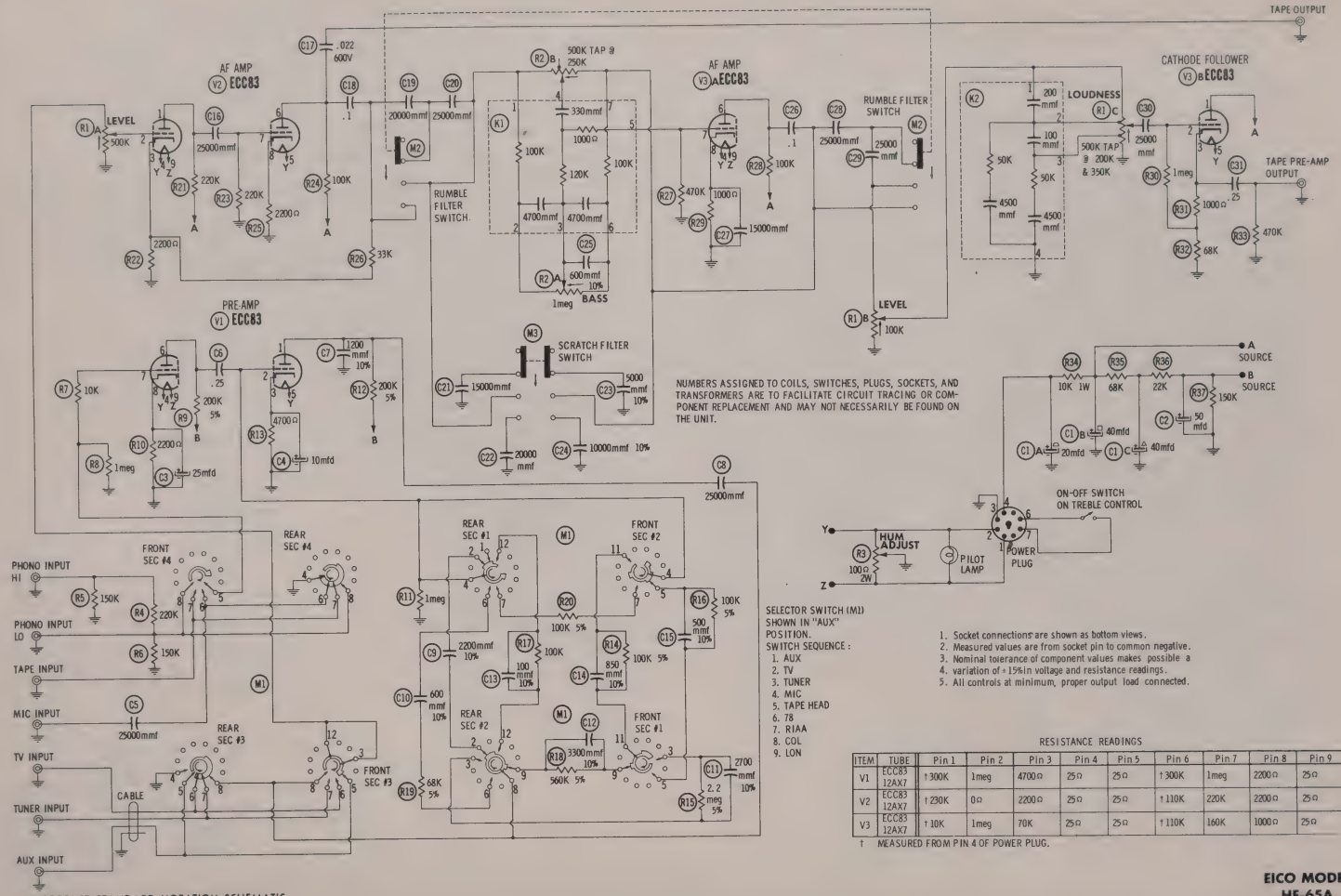
NAME	PART NO.	DESCRIPTION
Knob	53017	Off-On, Treble, Loudness
Knob	53016	Level, Bass
Knob	53018	Input Selector

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

SELECTOR SWITCH (M1) SHOWN IN "AUX" POSITION.
SWITCH SEQUENCE:
1. AUX
2. TV
3. TUNER
4. MIC
5. TAPE HEAD
6. 78
7. RIAA
8. COL
9. LON

1. Socket connections are shown as bottom views.
2. Measured values are from socket pin to common negative.
3. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
4. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	↑300K	1meg	4700Ω	25Ω	25Ω	↑300K	1meg	2200Ω	25Ω
V2	ECC83 12AX7	↑230K	0Ω	2200Ω	25Ω	25Ω	↑110K	220K	2200Ω	25Ω
V3	ECC83 12AX7	↑10K	1meg	70K	25Ω	25Ω	↑110K	160K	1000Ω	25Ω

↑ MEASURED FROM PIN 4 OF POWER PLUG.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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EICO MODEL HF-65A

PHOTOFACT® Folder with CIRCUITRACE®

**FORD MODELS
04MD, 04MF, 04MFM**

MODEL 04MF

TRADE NAME	Ford Models 04MF (COAF - 18805-U), 04MFM (COAF-18805-T) For 1960 Ford Automobiles 04MD (CODF - 18805-D For 1960 Falcon Automobiles
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd, Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built AM Automobile Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	540 - 1610KC RATING 1 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4. . . . . GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6 . . . . . GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528
A8, A9, A10. . . . . GENERAL CEMENT #9050-L, 9150
WALSCO #2521, 2524
All. . . . . GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Highside thru .1mfd to antenna receptacle. Low side to chassis.	262.5 KC (400∿ Mod.)	High end stop	Across voice coil	A1, A2 A3, A4	Adjust for maximum output
2.	Thru dummy (Fig. 1) to antenna receptacle	1610 KC	"	"	A5, A6, A7	"
	Step 3 is Not Necessary unless Tuner has been tampered with or associated components replaced. If necessary, back tuning coils (A8, A9 and A10) 1-3/8 inches out of coils. Repeat Step 2.					
3.	Thru dummy (Fig. 1) to antenna receptacle	1020 KC	Tune to 1020 KC signal	Across voice coil.	A8, A9 A10	Adjust for maximum output. Repeat steps 2 and 3 until no further improvement is noted. Cement coils in place.
4.	"	600 KC @ 5 microvolts	Tune to 600 KC signal	"	All	Adjust for 2.83 volts output
5.	With Radio tuned to a 1000 KC signal adjust pointer adjustment until pointer coincides with 1000 KC mark on the dial.					
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1200 KC and adjust A7 for maximum output.					

Pushbutton Adjustments

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining pushbutton.

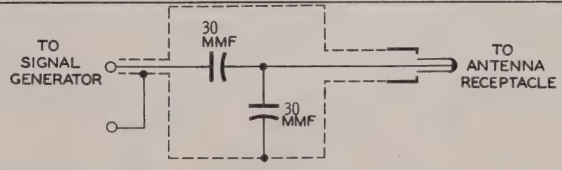

FIG. 1

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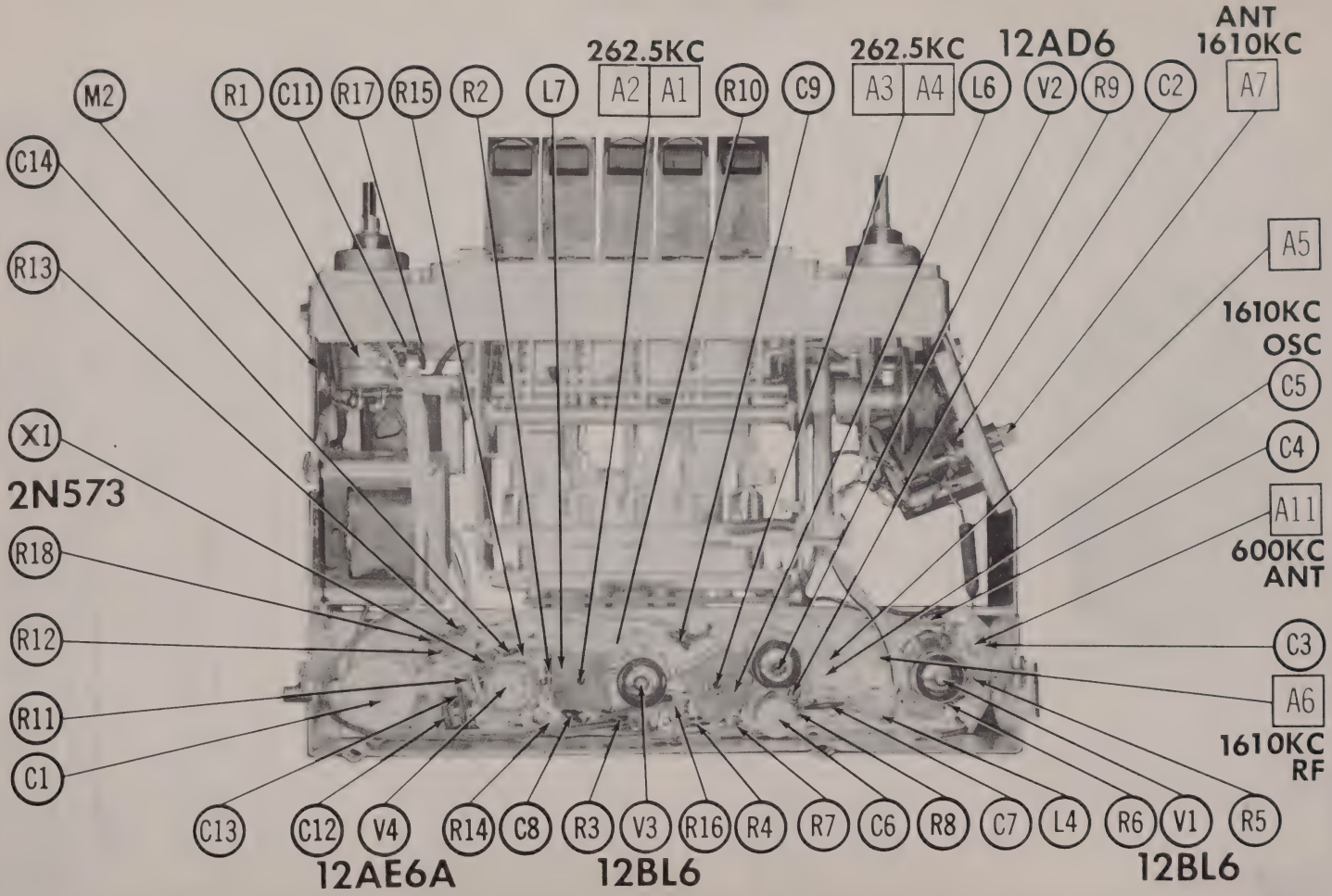
JD892

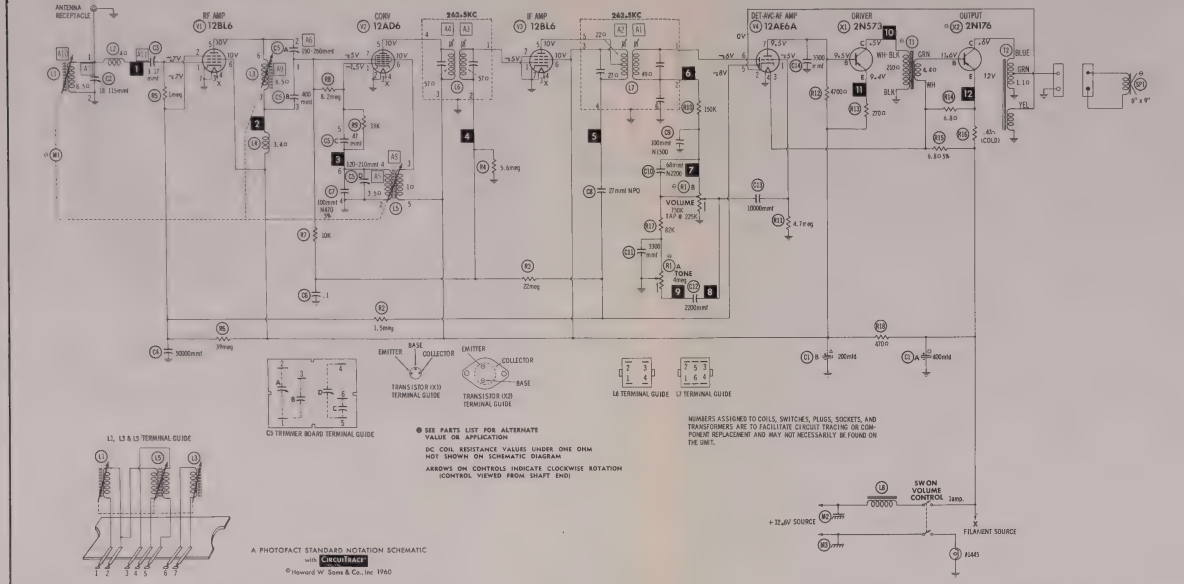
FORD MODELS
04MD, 04MF, 04MFM

FORD MODELS
04MD, 04MF, 04MFM

SET 486 FOLDER 10



CHASSIS-TOP VIEW


ANTENNA RECEPTACLE
RF AMP V1 12BL6
CONV V2 12AD6
262.5KC
IF AMP V3 12BL6
262.5KC
DET-AVC-AF AMP V4 12AE6A
DRIVER X1 2N573
OUTPUT X2 2N1176
VOLUME 250K TAP @ 225K
TONE 4meg
SW ON VOLUME CONTROL
+12.6V SOURCE
FILAMENT SOURCE
#1445
TRANSISTOR (X1) TERMINAL GUIDE
TRANSISTOR (X2) TERMINAL GUIDE
L8 TERMINAL GUIDE
L7 TERMINAL GUIDE
C5 TRIMMER BOARD TERMINAL GUIDE
L1, L3 & L5 TERMINAL GUIDE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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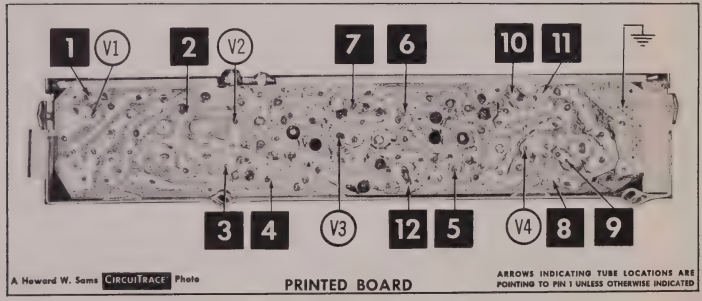
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	18meg	17meg	0Ω	3.5Ω	†470Ω	†470Ω	0Ω
V2	12AD6	33K	0Ω	0Ω	3.5Ω	†525Ω	†470Ω	3.5meg
V3	12BL6	3.5meg	0Ω	0Ω	3.5Ω	†490Ω	†470Ω	0Ω
V4	12AE6A	4.7meg	.4Ω	4.7Ω	0Ω	16meg	700K	

† MEASURED FROM JUNCTION OF R18 AND C1A

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN FOR X1 AND X2 BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



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PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

FORD MODELS
O4MD, O4MF, O4MFM

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire .....Use BELDEN No. 8885
Bonding Strap .....Use BELDEN No. 8661

TUBES

◆ CBS ◆		GENERAL ELECTRIC ◆		RAYTHEON ◆		SYLVANIA ◆
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6	
V2	Converter	12AD6	V4	Det - AVC - AF Amp.	12AE6A	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver	2N155	2N176	2N573	2N573	PNP
X2	2N176 *	Output				2N176	PNP

*When replacing, apply DC-4 grease (Part #11M490487) or equivalent to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■400	16	23B561100	PWH2-02-75		PWP201.13		PCLS-2173 *	
B	▲200	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	18-115	#20B534809				302-M		
C3	3-17	#21K564055						
C4	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C5A	150-260							
B	400	#20B563442						
C	47							
D	120-210							

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.1	100V		P2151N-1	DF-104	BC2P1J	1DP-2-104	ACE401	2SE-P10
C7	100	N470 5%	#21R129849				*		
C8	27	NPO		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C9	100	N1500	#21R129848		TCL-100		*		
C10	68	N2200	#21R129911				*		10TCS-068
C11	3300			BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C12	2200			BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C13	10000			BPD-01	DD-103	BYA105I	CCD-103	GP110	5HK-S10
C14	3300			BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33

#Motorola Part Number
*No normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	4 meg	1/2	18C563786	F1-82				Tone Note 1
B	750K	1/2		R2-59		† QJ-1258A	■UE4107-S	Volume Note 1
	225K tap							
C	Switch			KR-7				Power off-on

† "Concentrikit" equivalent: K-8 Kit with Base Elements and Shafts: B11-240, P17-105 (Panel)
B13-137X, R1-118 (Rear)
76-2 (Switch)
R5 (Retainer)

■ "STA-LOC" equivalent: FB46L, RU754T25, OS1187, IS1625, US42
Note 1. Some versions may use Part #18C562786.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1.5meg	
R3	22meg	
R4	5.6meg	
R5	1meg	
R6	39meg	
R7	10K	

ITEM No.	RATING	REMARKS
R8	8.2meg	
R9	33K	
R10	150K	
R11	4.7meg	
R12	4700Ω	
R13	290Ω	

ITEM No.	RATING	REMARKS
R14	6.8Ω	
R15	6.8Ω 5%	
R16	.47Ω Cold	#17A563407
R17	82K	
R18	470Ω	

Motorola Part Number.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	24C536308						
L2	RF Choke	24A532148	19-6033	19-6033	TV-180	6176	VP-1	31uh
L3	RF Coil	24C536308						
L4	RF Choke	24K563788	19-7047	19-7047		4628		44uh
L5	Osc. Coil	24B536300						
L6	1st IF Trans.	24K563462	16-6756	16-6756	BC-344	13-PHI		
L7	2nd IF Trans.	24D653300						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	1A	.4Ω	.010Hy.	25K561571						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	10	1	25C563595-C ①						

① Alternate Part #25C563595

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	18Ω	112Ω SEC.2 6-8Ω	25C563403							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6" x 9" 5" x 7"	PM PM	6-8Ω 6-8Ω	50D563080 * 50D563417 ♦	69A1Z8.7	*Used In Models 04MF, 04MFM ♦Used In Models 04MD

MISCELLANEOUS

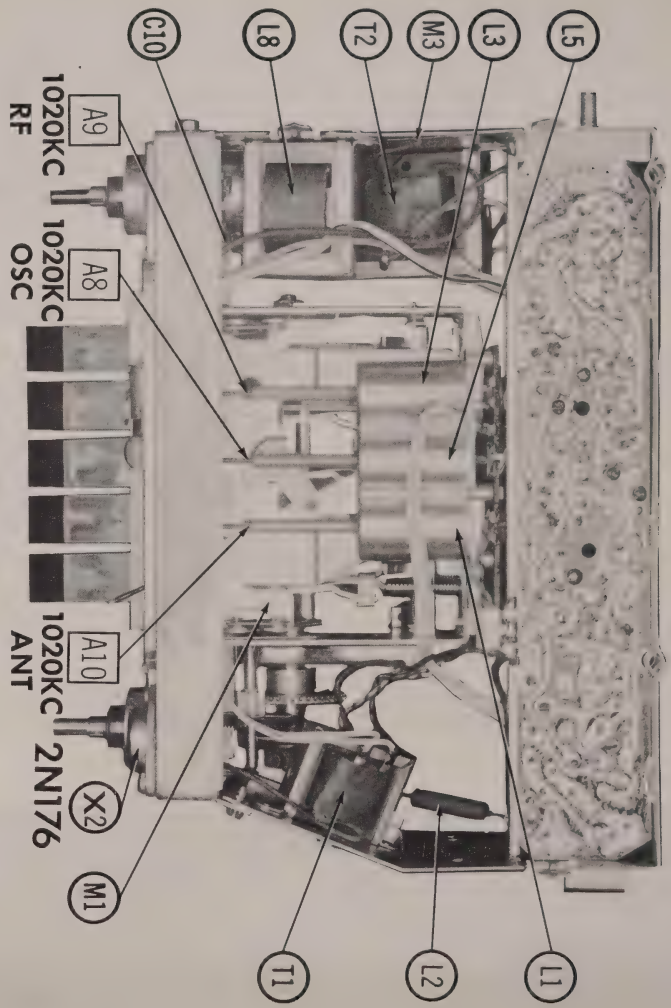
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuner	77E563360	Complete (AT-282) Model 04MF
	Tuner	77D563510	Complete (MAT-302) Model 04MFM
	Tuner	77K564153	Complete (MAT-313) Model 04MD
M2	Spark plate	64K563410	
M3	Spark plate	64K563410	
	Printed Board	84K563467	Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36B562701	Tuning and Volume, Models 04MF, 04MFM
Knob	36B562960	Tuning and Volume, Models 04MD
Knob	36B562974	Tone and Dummy
Pushbutton	38B563120	Model 04MF
Pointer	1B562901	
Dial Scale	34K564133	Model 04MD
Dial Scale	34C562934	Model 04MF, 04MFM

CHASSIS—BOTTOM VIEW



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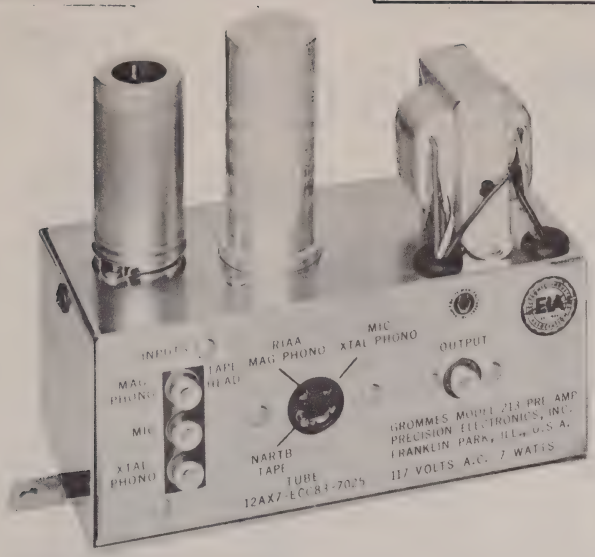
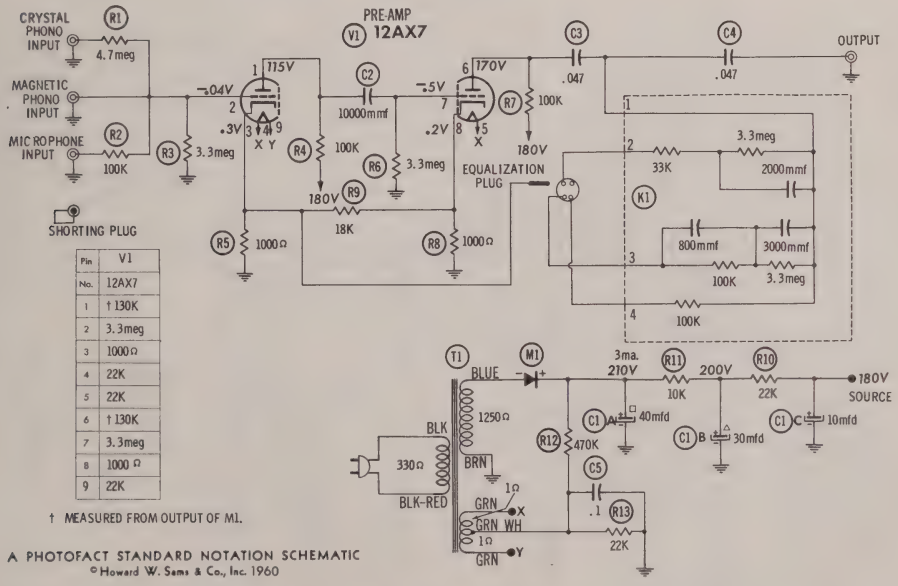
GROMMES MODEL 213

GROMMES
MODEL 213



TRADE NAME	Grommes Model 213
MANUFACTURER	Precision Electronics, 9101 King Ave., Franklin Park, Illinois
TYPE SET	AC Operated One Tube Preamplifier
POWER SUPPLY	110 - 120 Volts AC, 50-60 Cycles RATING 5 Watts, .05 Amp. @117 Volts AC



Pin No.	V1
1	† 130K
2	3.3meg
3	1000Ω
4	22K
5	22K
6	† 130K
7	3.3meg
8	1000 Ω
9	22K

† MEASURED FROM OUTPUT OF M1.

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JW754

SET 486 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamplifier	12AX7/ECC83			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■40	250		AFH3-19	XB0250	FP333.5		TVL-2724	
B	▲30	250			BBR12-250			TVA-1510	
C	10	250							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	4.7meg	
R2	100K	
R3	3.3meg	
R4	100K	
R5	1000Ω	

ITEM No.	RATING	REMARKS
R6	3.3meg	
R7	100K	
R8	1000Ω	
R9	18K	
R10	22K	

ITEM No.	RATING	REMARKS
R11	10K	
R12	470K	
R13	22K	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	GROMMES PART No.	REPLACEMENT DATA
K1	Tone Comp.	800mmf, 2000mmf, 3000mmf, 33K, (2) 100K, (2) 3.3meg	PC-1960	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .050A	160V@ .003A	6.3VCT @ .3A	TP-6PA						

RECTIFIERS

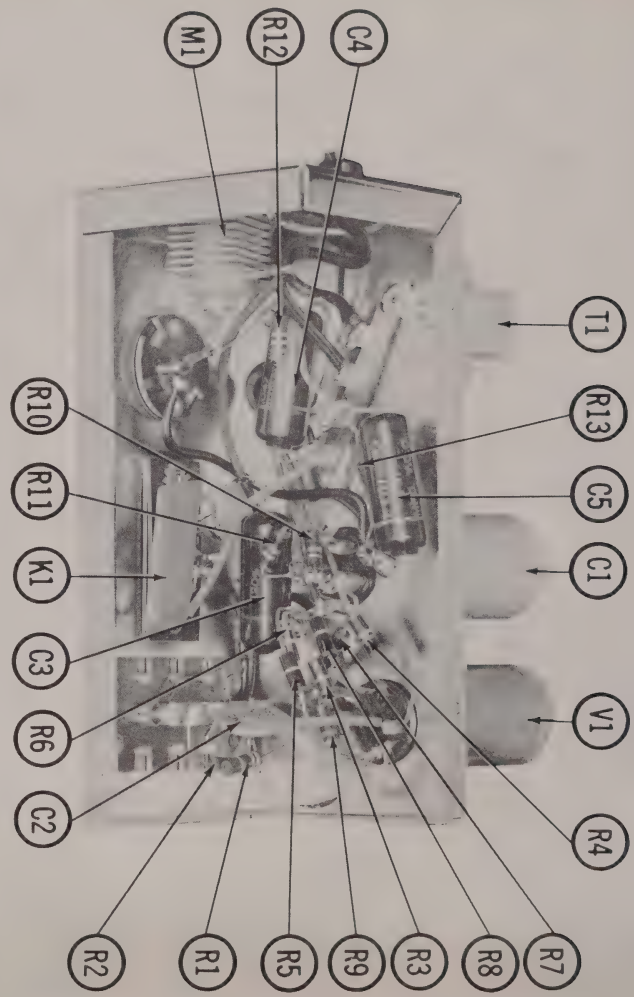
ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA GROMMES PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.003A	①	RS050 ①		50 ①	SR200 ②	① Selenium Type ② Silicon Type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

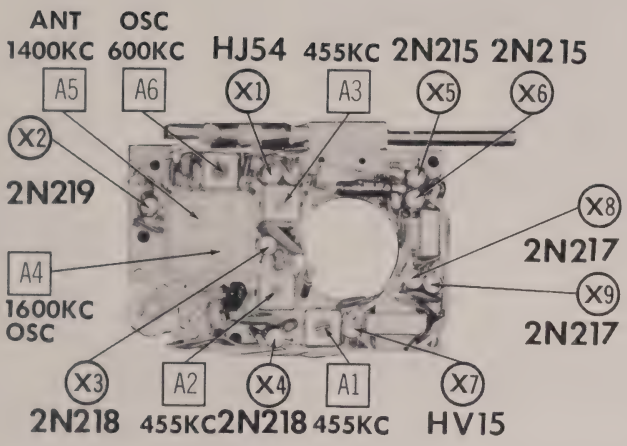
CHASSIS—BOTTOM VIEW



12AX7

PHOTOFACT® Folder with CIRCUITRACE®

HITACHI MODEL TH-862R



TRADE NAME	Hitachi Model TH-862R
IMPORTER	Electronic Utilities Co., Div. of The Sampson Co, 2244 S. Western Ave., Chicago 8, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	5MA @ 9 Volts DC (No Signal, Min. Volume) 10MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 — 1605KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

A4, A5..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	1400KC	Tune to 1400KC Signal.	"	A5	"
4.	"	600KC	Tune to 600KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

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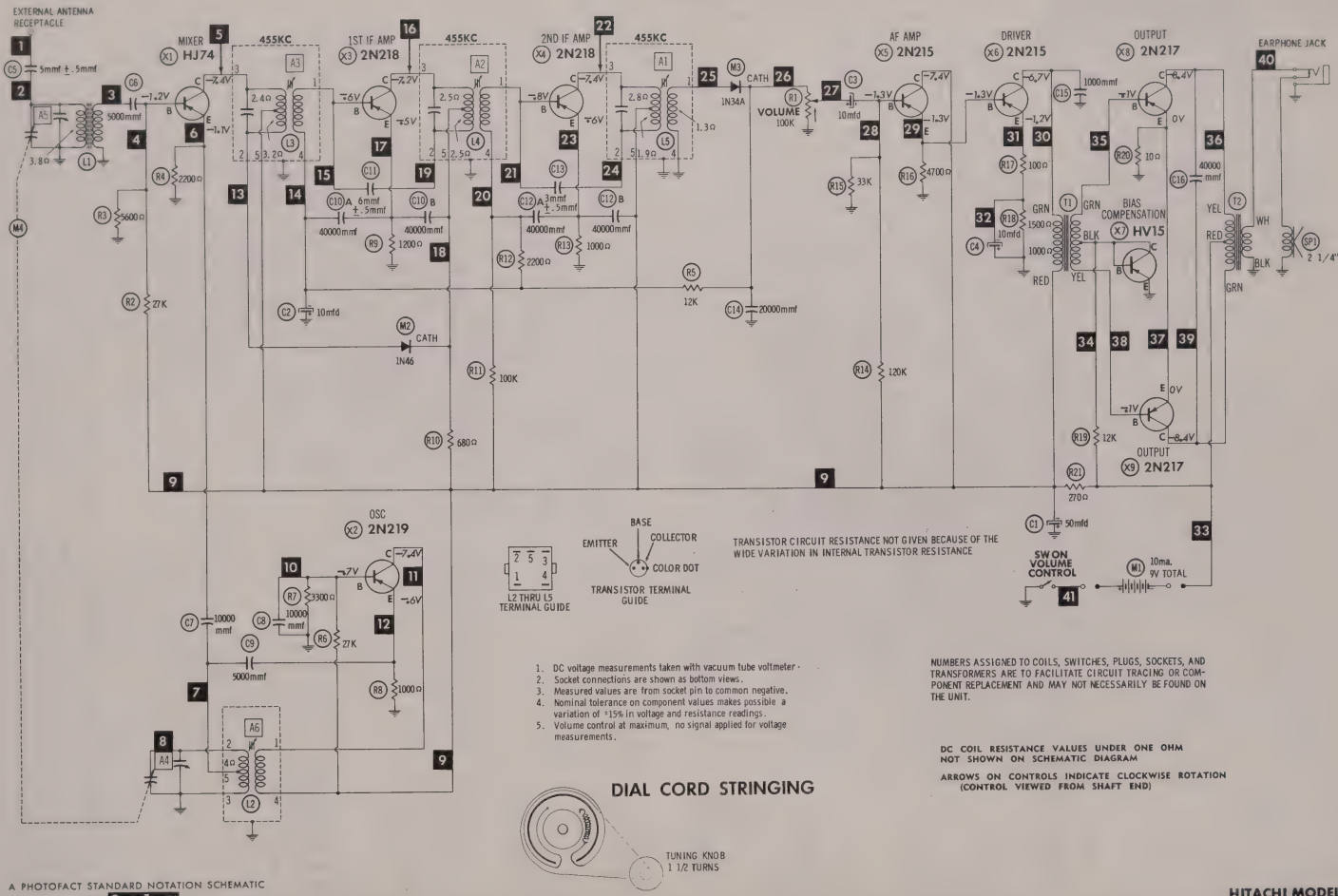
SET 486 FOLDER 12


EXTERNAL ANTENNA RECEPTACLE
MIXER X1 HJ74
455KC
1ST IF AMP X3 2N218
2ND IF AMP X4 2N218
AF AMP X5 2N215
DRIVER X6 2N215
OUTPUT X8 2N217
EARPHONE JACK
VOLUME 100K
1N34A
CATH
1N46
BIAS COMPENSATION X7 HV15
OUTPUT X9 2N217
OSC X2 2N219
SW ON VOLUME CONTROL
M1 10ma. 9V TOTAL
L2 THRU L5 TERMINAL GUIDE
TRANSISTOR TERMINAL GUIDE
BASE
EMITTER
COLLECTOR
COLOR DOT
TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
DIAL CORD STRINGING
TUNING KNOB 1 1/2 TURNS

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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HITACHI MODEL TH-862R

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	HJ74	Mixer			2N486		PNP
X2	2N219	Oscillator		2N412	2N485		PNP
X3	2N218	1st IF Amplifier		2N410	2N482	2N218	PNP
X4	2U218	2nd IF Amplifier		2N410	2N482	2N218	PNP
X5	2N215	AF Amplifier		2N406	2N362	2N215	PNP
X6	2N215	Driver		2N406	2N362	2N215	PNP
X7	HV15	Bias Compensation					
X8	2N217	Output		2N408	2N633	2N217	PNP
X9	2N217	Output		2N408	2N633	2N217	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	HITACHI PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	10		XPP-10050	NLW50-10	TT50X10	ML10-15	TE-1119	
C2	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C3	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C4	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	5 + .5mmf		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C6	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50	
C7	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C8	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C9	5000		C80V502AM	DM-502	H-05D5	CCD-502	TA-250	TG-D50	
C10A	40000	}							
B	40000								
C11	6 + .5mmf				C10V6C			10TCC-V56	
C12A	40000	}							
B	40000								
C13	3 + .5mmf		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33	
C14	20000		C80V203AM	DDM-203	H-05S2	CCD-103	TA-120	TG-S20	
C15	1000		C80V102AM		H-05D1	CCD-102	GP210	10TS-D10	
C16	40000								

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HITACHI PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	100K	1/4	34.05					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	27K	
R3	5600Ω	
R4	2200Ω	
R5	12K	
R6	27K	
R7	3300Ω	
R8	1000Ω	

ITEM No.	RATING	REMARKS
R9	1200Ω	
R10	680Ω	
R11	100K	
R12	2200Ω	
R13	1000Ω	
R14	120K	
R15	33K	

ITEM No.	RATING	REMARKS
R16	4700Ω	
R17	100Ω	
R18	1500Ω	
R19	12K	
R20	10Ω	
R21	270Ω	

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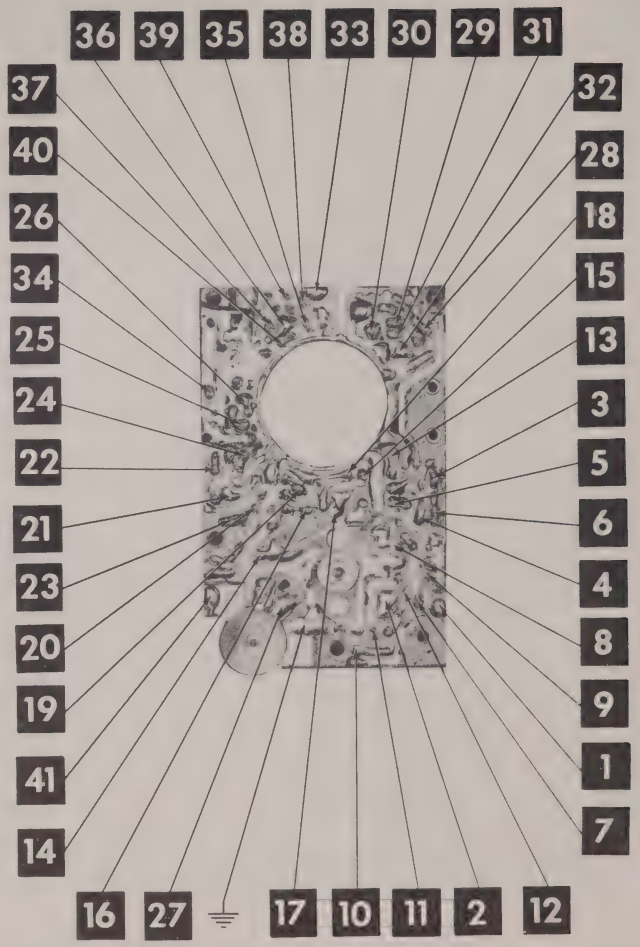


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		HITACHI PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	HITACHI PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	.7	1	CT-65						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HITACHI PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2250Ω CT	10-12Ω	OT-70							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HITACHI PART No.	QUAM PART No.	
SP1	2 1/4"	PM	10-12Ω	SP2301	22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	HITACHI PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		HITACHI PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		1N46	1N636	1N295	1N295	Overload (Pigtail)
M3		1N34A	1N34A	1N34A	1N34A	Det. & AVC (Pigtail)

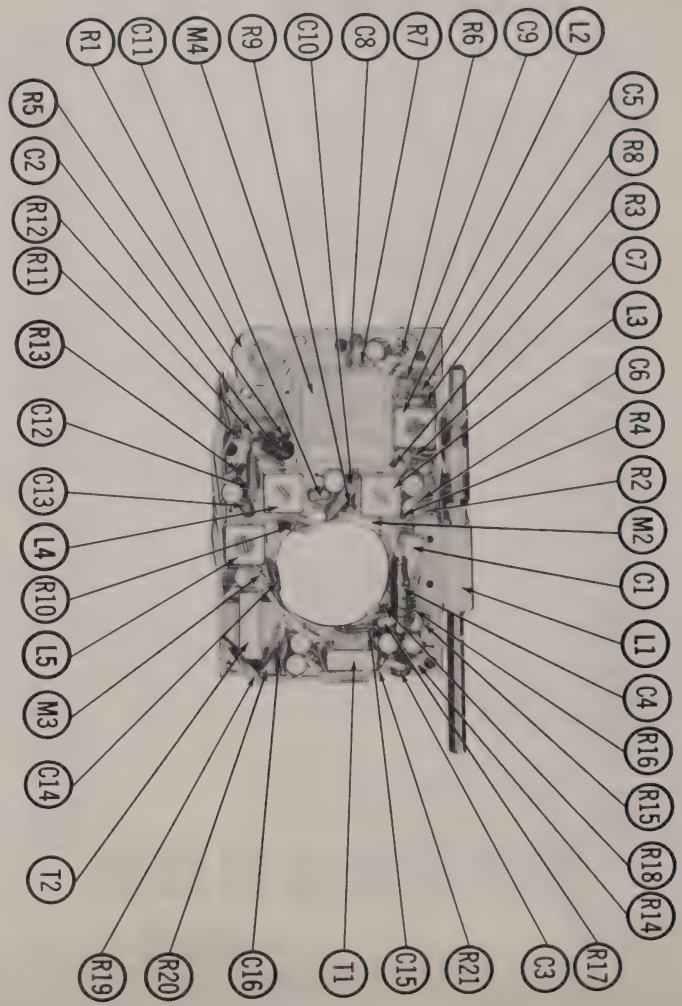
MISCELLANEOUS

ITEM No.	PART NAME	HITACHI PART No.	NOTES
M4	Tuning Cap Earphone	EL-213	2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder

HOFFMAN MODELS 20B811, 20BA811, 20G810, 20T810, 20W811 (Ch. 1137)

HOFFMAN MODELS 20B811, 20BA811, 20G810, 20T810, 20W811 (Ch. 1137)

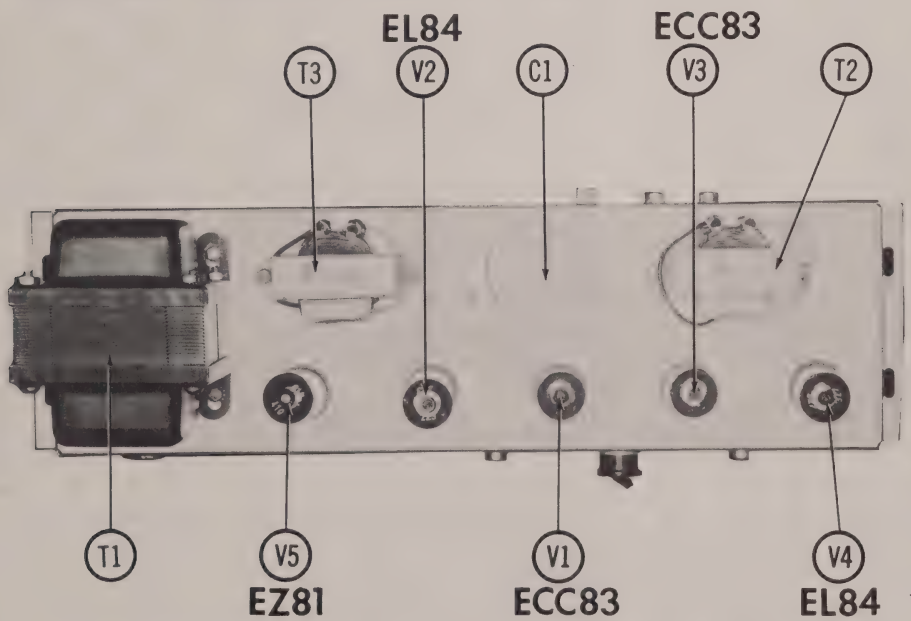
MODEL 20T810

HOFFMAN MODELS 20B811, 20BA811, 20G810, 20T810, 20W811 (Ch. 1137)

TRADE NAME	Hoffman Models 20B811, 20BA811, 20G810, 20T810, 20W811, (Ch. 1137)
MANUFACTURER	Hoffman Electronics Corp., 6200 S. Avalon Blvd., Los Angeles 3, California
TYPE SET	AC Operated 5 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 62 Watts, .6 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #990009 USED IN MODELS 20G810, 20T810 — SEE SIMILAR GLASER-STEERS 77 — PHOTOFACT SET 399 FOLDER 7

RECORD CHANGER PART #990010 USED IN MODELS 20B811, 20BA811, 20W811



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

EIA

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SET 486 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp.	ECC83/12AX7 (ECC83/7025) *	V4	Right Channel Output	EL84 (EL84/6BQ5) *
V2	Left Channel Output	EL84(EL84/6BQ5) *	V5	Rectifier	EZ81 (EZ81/6CA4) *
V3	Right Channel AF Amp.	ECC83/12AX7 (ECC83/7025) *			

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA HOFFMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	400	857105	AFH4-93-50	CO370	FP420.46	TMT-43	TVLS-4657.8*	
B	■40	350			BR2035		TD-20-350		
C	▲20	300							
D	20	300							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C3	470	(47mmf 10%) †	BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-203
C5	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C7	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C8	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C9	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C11	1500 1500V		HVD-15-1500	DD16-152	HVB20D15	6DP-1-152	ZHV-215	30GA-D15
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C13	470	(47mmf 10%) †	BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP203	5HK-S20
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C16	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C17	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C18	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C19	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C21	1500 1500V		HVD-15-1500	DD16-152	HVB20D15	6DP-1-152	2HV-215	30GA-D15
C22	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

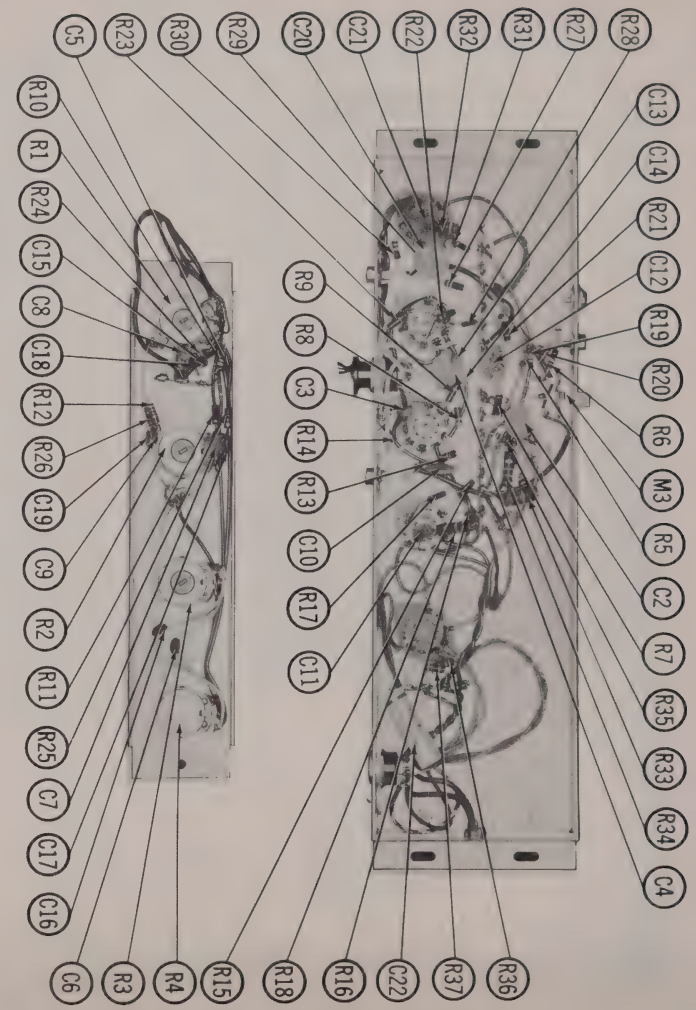
† Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg 500K Tap	½	802051	BT-74			FB16T55 *	Loudness, Right Channel
B	1meg 500K Tap	½		STR-74			RU16T55	Loudness, Left Channel
R2A	1meg	½	802053	B-70	AD47-1meg-Z		FA16A	Bass, Right Channel
B	1meg	½		SR-70	Not Req.		RU16A	Bass, Left Channel
C	Shaft			Not Req.	FS-3		CS3500	
R3A	400K	½	802052	B-60				Treble, Left Channel
B	400K	½		SR-60				Treble, Right Channel
R4A	2meg	½	800068	B-75	A47-2meg-S	Q11-139	U56	Balance
B	Shaft			Not Req.	FS3	Not Req.	Not Req.	

* Use CS3500 Shaft.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	390K	
R6	47K	
R7	2.2meg	
R8	100K	
R9	2200Ω	
R10	390K	
R11	33K	
R12	68K	
R13	120K	
R14	1800Ω	
R15	1000Ω	

ITEM No.	RATING	REMARKS
R16	330K	
R17	220Ω	
R18	270Ω 1W	
R19	390K	
R20	47K	
R21	2.2meg	
R22	100K	
R23	2200Ω	
R24	390K	
R25	33K	
R26	68K	

ITEM No.	RATING	REMARKS
R27	120K	
R28	1800Ω	
R29	1000Ω	
R30	330K	
R31	220Ω	
R32	2900Ω 1W	
R33	120Ω 1W	
R34	33K 1W	
R35	47K	
R36	47Ω	
R37	47Ω	
R38	22Ω	
R39	22Ω	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .6A	560VCT Ⓐ .080A	6.3V Ⓐ .9A	716007						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V Ⓐ 2.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	11K	10-12Ω	724033	24S06	A-2901	AU-600	A-3823	24S06	S-53X	
T3	11K	10-12Ω	724033	24S06	A-2901	AU-600	A-3823	24S06	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HOFFMAN PART No.	QUAM PART No.	
SP1	6"	PM	12-14Ω	708403	6A1Z14	① Models 20BA811, 20B811, 20W811 only.
SP2	4"	PM	12-14Ω	708016	4A1Z12	
SP3	6"	PM	12-14Ω	708403	6A1Z14	
SP4	4"	PM	12-14Ω	708016	4A1Z12	
	3½"	PM		708015 ①		
	6"	PM		708404 ①		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	HOFFMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	981006 ① 981022 †	13TB		* 66				10T2-S	

① Includes needles. Late versions use Part #981021.
* Use Mount PT-3.
† Includes needles. Used in Models 20BA811, 20B811, 20W811.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HOFFMAN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	981007 † ①(or) 981015 ▪ ① 981022 ②			† Dual Sapphires ▪ Sapphire-Diamond ① Late versions use Part #981021 (includes needles) ② Includes cartridge. Models 20B811, 20BA811, 20W811

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3	Switch	904005	Tuner-Phono (DPDT, Slide Type)

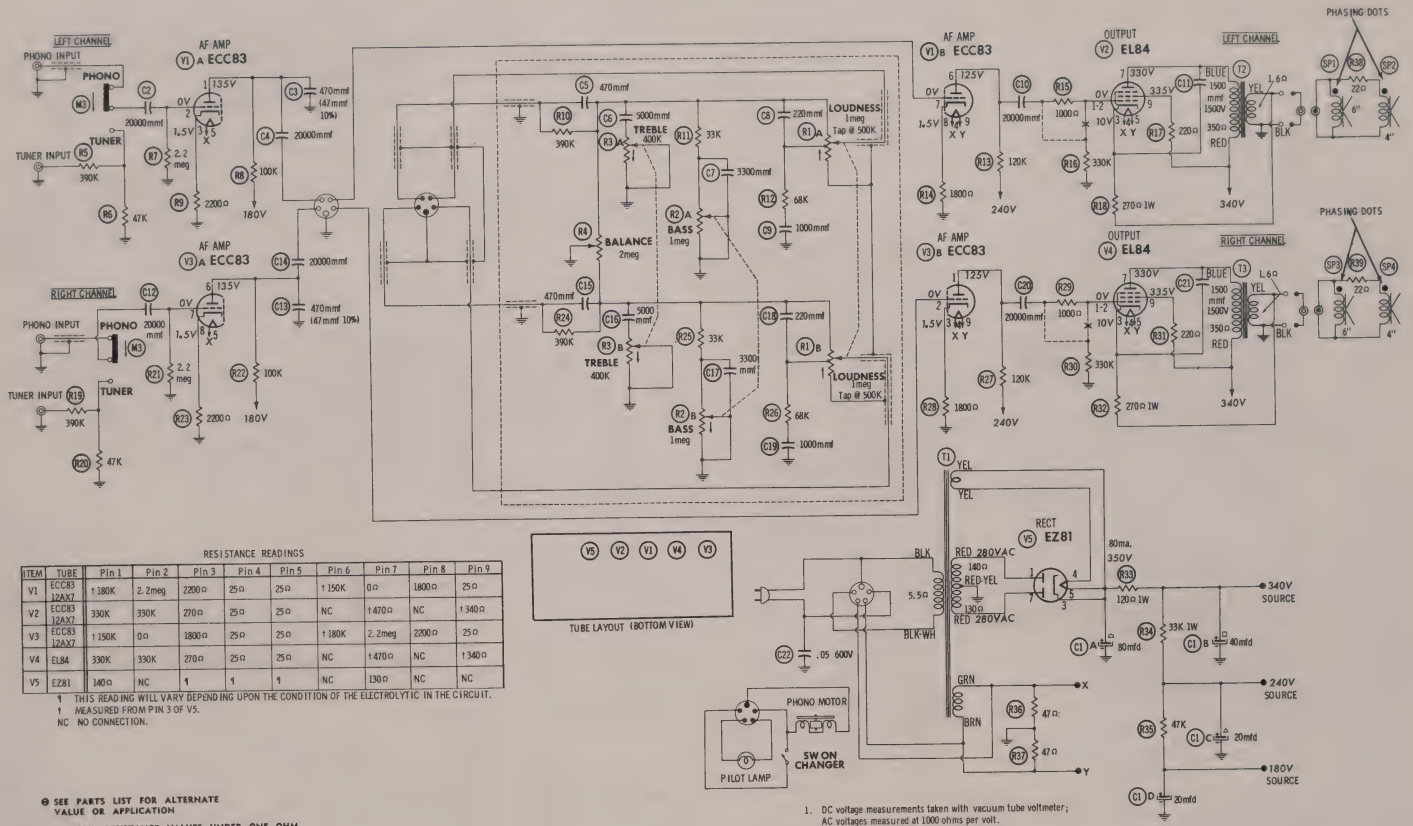
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	500051	Model 20T810
Knob	500059	Model 20G810
Cabinet	383003	Model 20T810
Cabinet	383002	Model 20G810
Cabinet	383004	Model 20BA811
Cabinet	383005	Model 20W811
Cabinet	383006	Model 20B811
Handle	281003	Model 20T810
Handle	281002	Model 20G810

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	↑180K	2.2meg	2200Ω	25Ω	25Ω	↑150K	0Ω	1800Ω	25Ω
V2	ECC83 12AX7	330K	330K	270Ω	25Ω	25Ω	NC	↑470Ω	NC	↑340Ω
V3	ECC83 12AX7	↑150K	0Ω	1800Ω	25Ω	25Ω	↑180K	2.2meg	2200Ω	25Ω
V4	EL84	330K	330K	270Ω	25Ω	25Ω	NC	↑470Ω	NC	↑340Ω
V5	EZ81	140Ω	NC	¶	¶	¶	NC	130Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
↑ MEASURED FROM PIN 3 OF V5.
NC NO CONNECTION.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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HOFFMAN MODELS 20B811, 20BA811, 20G810, 20T810, 20W811 (Ch. 1137)

PHOTOFACT® Folder with CIRCUITRACE®

MACO MODEL AB-100

MACO MODEL AB-100

MACO MODEL AB-100

TRADE NAME	Maco Model AB-100
SUPPLIER	Maco Electric Corp., 1776 Broadway, New York 19, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	5MA@9 Volts DC (No Signal, Minimum Volume) 11MA@9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1600KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A4, A6.... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	Tune to 600KC signal.	"	A5	Adjust for maximum output while rocking tuning gang.
4.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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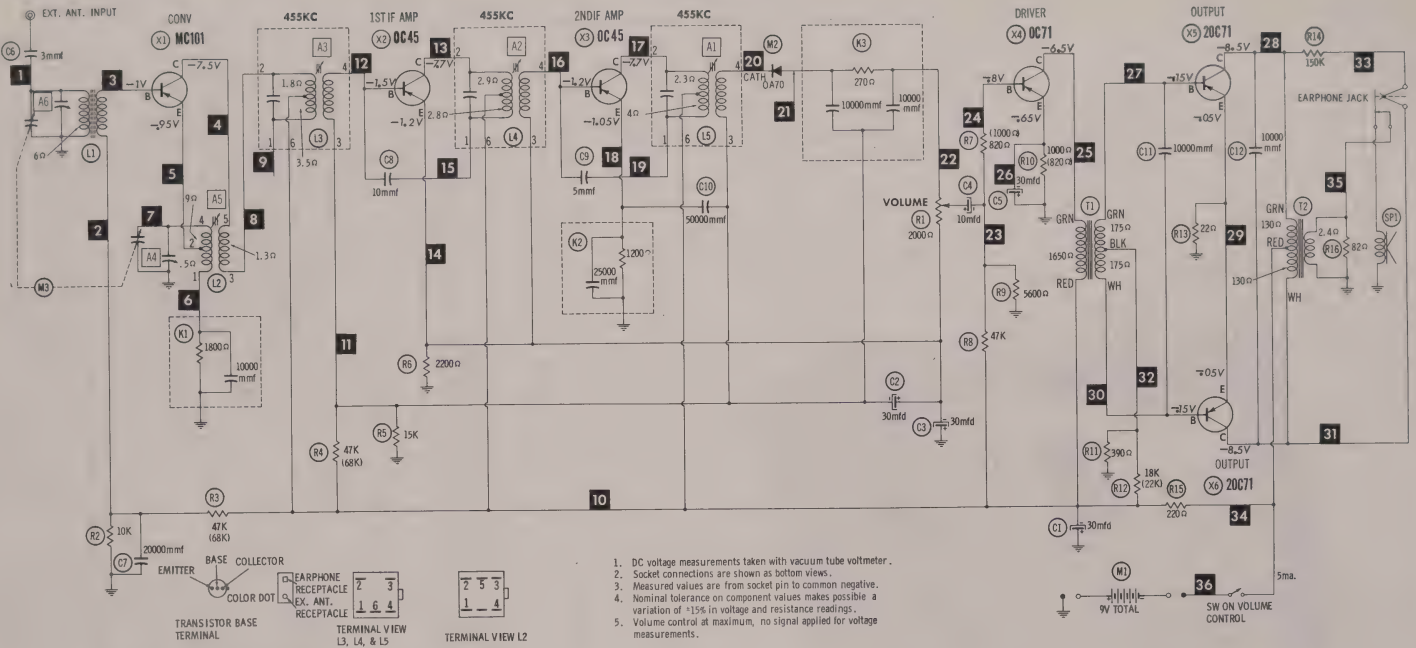

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

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MACO MODEL AB-100

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	MC101	Converter			2N486		PNP
X2	OC45	1st IF Amplifier			2N483		PNP
X3	OC45	2nd IF Amplifier			2N483		PNP
X4	OC71	Driver			2N362		PNP
X5	2OC71	Output			2N632		PNP ¬ Matched
X6	2OC71	Output			2N632		PNP ⌟ Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MACO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	10	NCT-10V30	XPP-10030	NLW30-15	TT15X30	ML30-15	TE-1158	
C2	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	
C3	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	
C4	10	3	NCT-3V10	XPP-3010	NLW10-3	TT3X10	ML10-6	TE-1053	
C5	30	3	NCT-3V30	XPP-3030	NLW30-6	TT6X30	ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	3		NPO-SI 3.0	TCZ-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33	
C7	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20	
C8	10		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10	
C9	5		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V5	
C10	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50	
C11	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10	
C12	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MACO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2000Ω	1/4	SNVa-16ZF					Loudness & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	10K	
R3	47K	(68K) *
R4	47K	(68K) *
R5	15K	
R6	2200Ω	

ITEM No.	RATING	REMARKS
R7	820Ω	(1000Ω) *
R8	47K	
R9	5600Ω	
R10	1000Ω	(820Ω) *
R11	390Ω	

ITEM No.	RATING	REMARKS
R12	18K	(22K) *
R13	22Ω	
R14	150K	
R15	220Ω	
R16	82Ω	

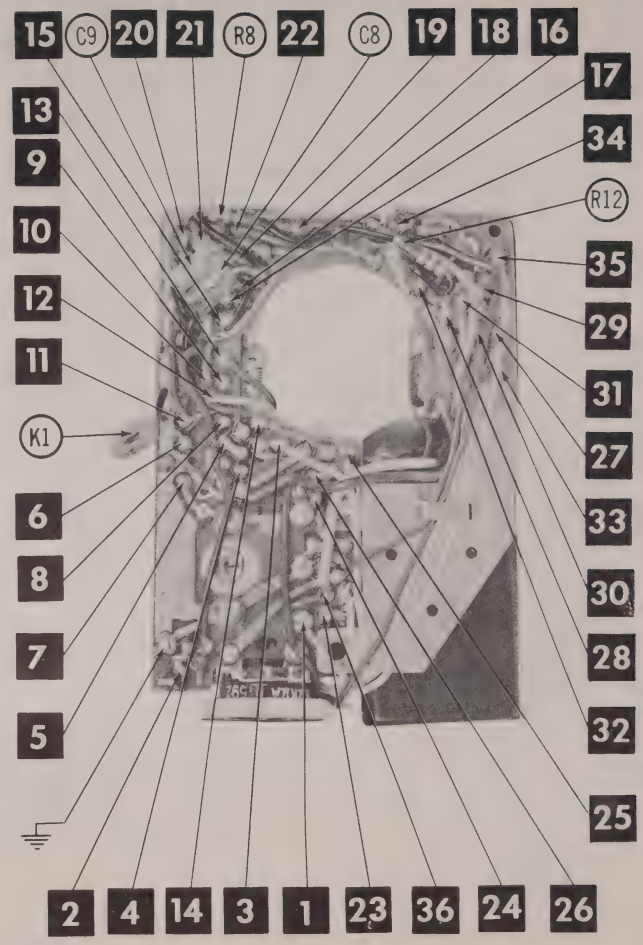
* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MACO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	AM2055A						
L2	Osc. Coil	AOP2-Y						
L3	1st IF Trans.	TI-Z1A						
L4	2nd IF Trans.	TI-Z2B						
L5	3rd IF Trans.	TI-Z3B						

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MACO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	TIT-6						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MACO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	260Ω CT	10Ω	TT-201							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MACO PART No.	QUAM PART No.	
SP1	2"	PM	8-10Ω	P-220S		

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MACO PART No.	REPLACEMENT DATA
K1 K2 K3	Converter Emitter Bias 2nd IF Emitter Bias Diode RF Filter	10000mmf, 1800Ω 25000mmf, 1200Ω (2) 10000mmf, 270Ω	CR-21 CR-22 CR-31	

BATTERIES

ITEM No.	VOLTAGE	MACO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MACO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	0A70		1N60	1N60	1N60	Det. & AVC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MACO PART No.	NOTES
M3	Tuning Cap.	PVC-2BM	2 Gang

CABINETS & CABINET PARTS

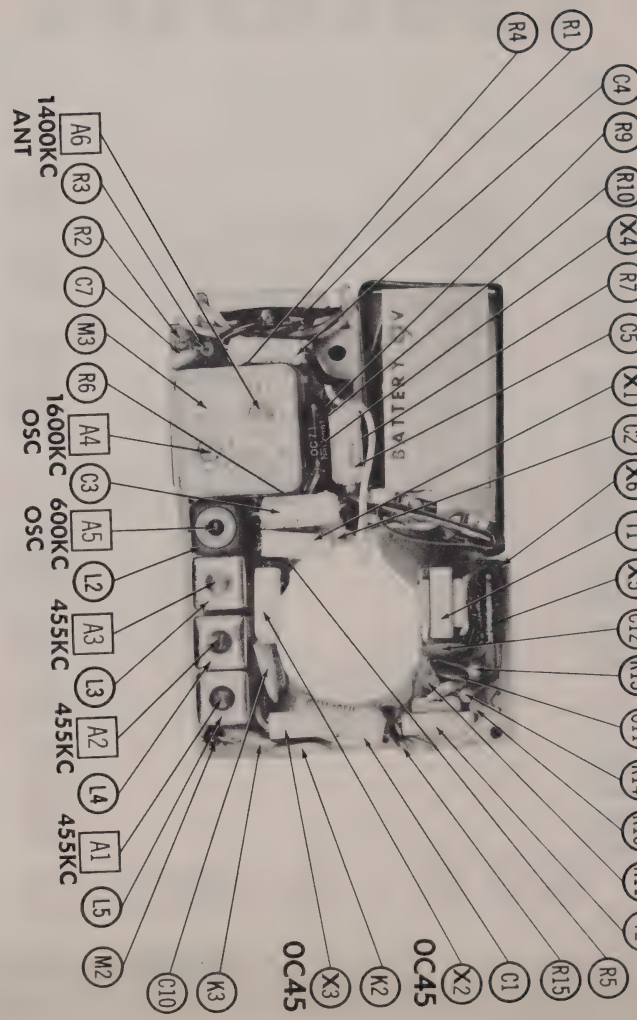
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob Knob Cabinet	AT-100 Knob T AT-100 Knob V AT-100 Cab.	Tuning Volume

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



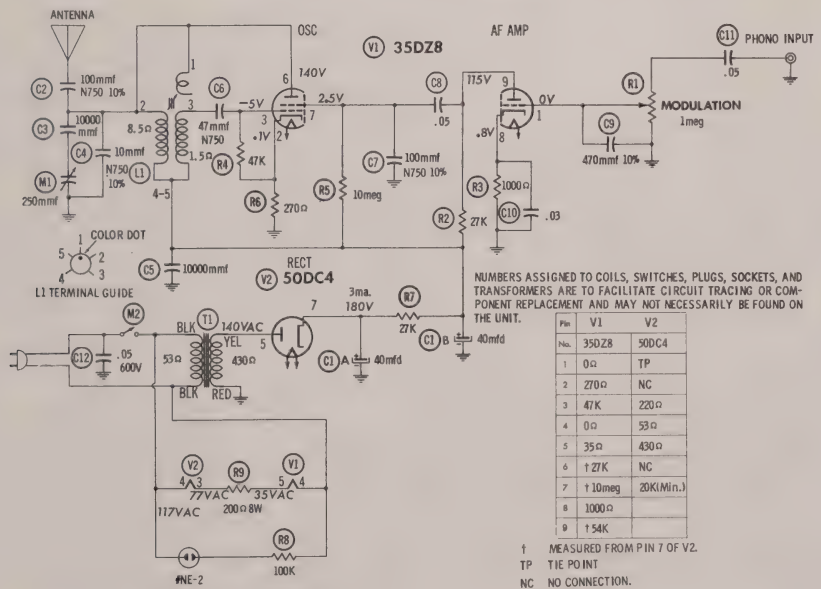
PHOTOFACT® Folder

MASCO MODEL
Stereo Broadcaster

MASCO MODEL
Stereo Broadcaster

TRADE NAME	Masco Model Stereo Broadcaster
MANUFACTURER	Mark Simpson Mfgr. Co., Inc., 32-28 49th Street, Long Island City 3, N. Y.
TYPE SET	AC Operated 2 Tube Phono Oscillator
POWER SUPPLY	110 - 120 Volts AC, 50-60 Cycles RATING 20 Watts, .2 Amp. @117 Volts AC

NOTE: ADJUST M1 FOR FREQUENCY DESIRED AND R1 FOR CLARITY OF SOUND.



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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

Pin No.	V1 35DZ8	V2 50DC4
1	0Ω	TP
2	270Ω	NC
3	47K	220Ω
4	0Ω	53Ω
5	35Ω	430Ω
6	†27K	NC
7	†10meg	20K(Min.)
8	1000Ω	
9	†54K	

† MEASURED FROM PIN 7 OF V2.
TP TIE POINT
NC NO CONNECTION.

MASCO MODEL
Stereo Broadcaster

SET 486 FOLDER 15

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JZ639

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier-Oscillator	35DZ8	V2	Rectifier	50DC4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MASCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	150	1968	PRS2195	BBRD4415	TCD48	TDLD-7	TVA-2445	
B	40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C7	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C8	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C9	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C10	.03 200V		P288N-03	DD-303	CUB6S3	4DP-2-303	GEM-413	4TM-S3
C11	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C12	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	1meg	½						Modulation

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	27K	
R3	1000Ω	
R4	47K	

ITEM No.	RATING	REMARKS
R5	10meg	
R6	270Ω	
R7	27K	

ITEM No.	RATING	REMARKS
R8	100K	
R9	200Ω 8W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MASCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Osc. Coil							

TRANSFORMER (POWER)

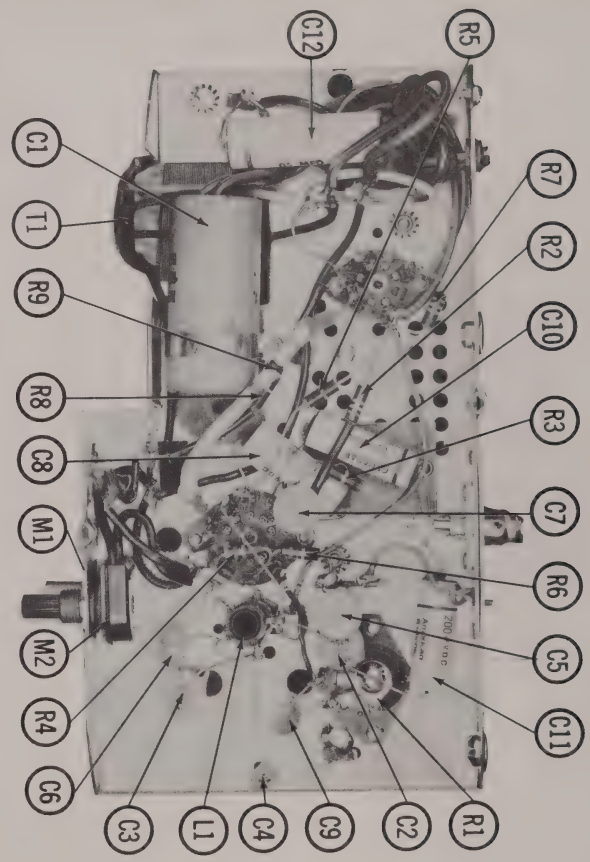
ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MASCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .2A	140V ⓐ .003A		PF-4				PS-8415 ①		

① Drill new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Tuning Cap		3-390mmf
M2	Switch		Off-On

CHASSIS—BOTTOM VIEW



WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

METEOR MODEL 9000 (Ch. 132.42001)

METEOR MODEL
9000 (Ch. 132.42001)

METEOR MODEL
9000 (Ch. 132.42001)

TRADE NAME	Meteor Model 9000 (Ch. 132.42001)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC-DC Operated 4 Tube AM Receiver
POWER SUPPLY	110 - 120 Volts AC-DC RATING 25 Watts, .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1670KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Disconnect hank antenna during alignment.
Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A1, A2.....GENERAL CEMENT #5097, 8727
WALSCO #2515
A3, A4.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A5, A6.....GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output.
2.	High side thru 50mmf to antenna connection. Low side to chassis.	1670KC	"	"	A3	"
3.	"	1400KC	Tune to 1400KC Signal.	"	A4	Adjust for maximum output while rocking tuning gang.
4.	"	600KC	Tune to 600KC Signal.	"	A5, A6	"

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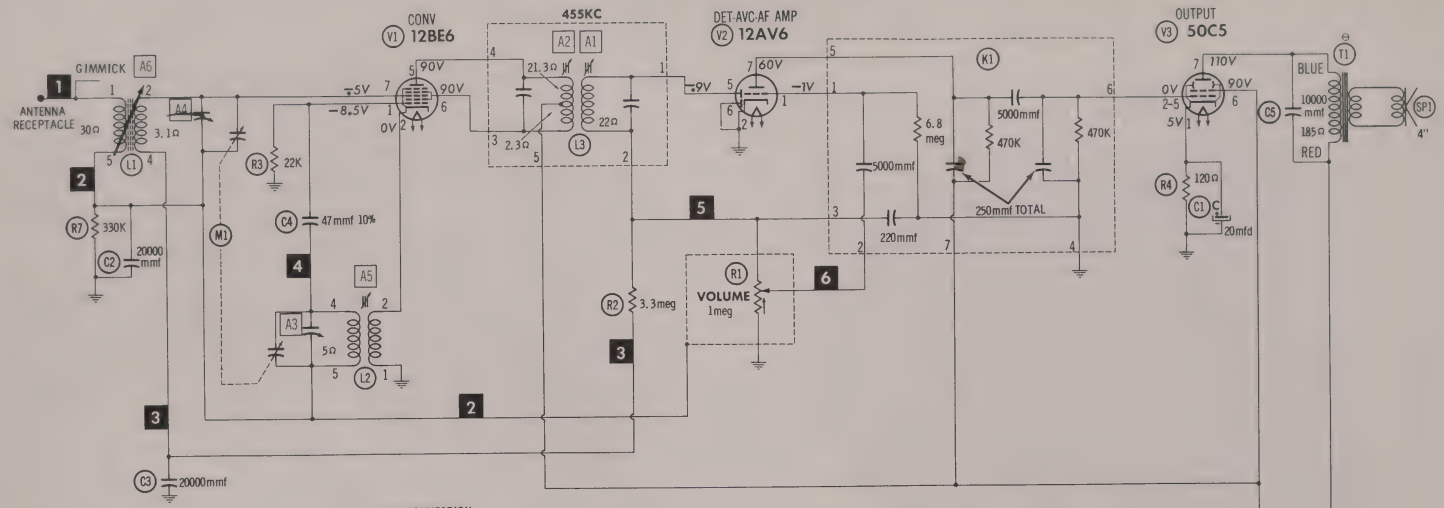
SET 486 FOLDER 16



Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.5Ω	12Ω	24Ω	†2200Ω	†2200Ω	4.3meg
V2	12AV6	6.8meg	0Ω	12Ω	0Ω	1meg	0Ω	†470K
V3	50C5	120Ω	470K	70Ω	120Ω	470K	†2200Ω	†185Ω
V4	35W4	TP	TP	120Ω	155Ω	155Ω	150Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
TP TIE POINT.

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METEOR MODEL 9000 (Ch. 132.42001)

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	Det. -AVC-AF Amp.	12AV6
V3	Output	50C5
V4	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	METEOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	44772-2	PRS4500	BBRT5315C	TCT3107	TDLT-15	TVA-3430	
B	20	150							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C3	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C4	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	METEOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	43613					Volume
B	Switch							Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	3.3meg	
R3	22K	
R4	120Ω	
R5	2200Ω 1W	
R6	47Ω 2W	
R7	330K	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		METEOR PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	44132-1						
L2	Osc. Coil	43644-7						
L3	IF Trans.	43622-1						

PRINTED BOARD

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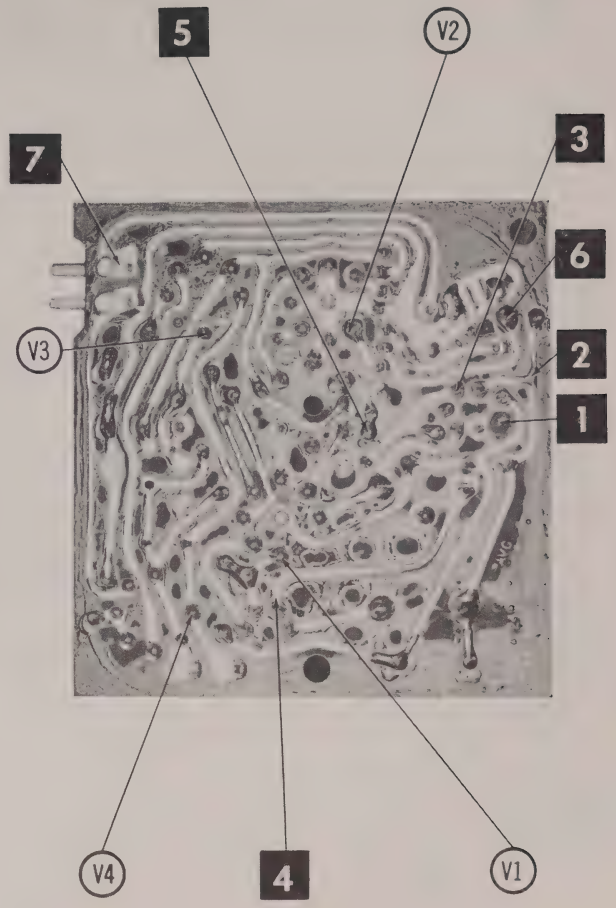
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	METEOR PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	42700-11①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	①Alternate Part # 42700-21

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	METEOR PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	43096	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	METEOR PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	43743-2	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

MISCELLANEOUS

ITEM No.	PART NAME	METEOR PART No.	NOTES
M1	Tuning Cap. Printed Board	43614 44787-1	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

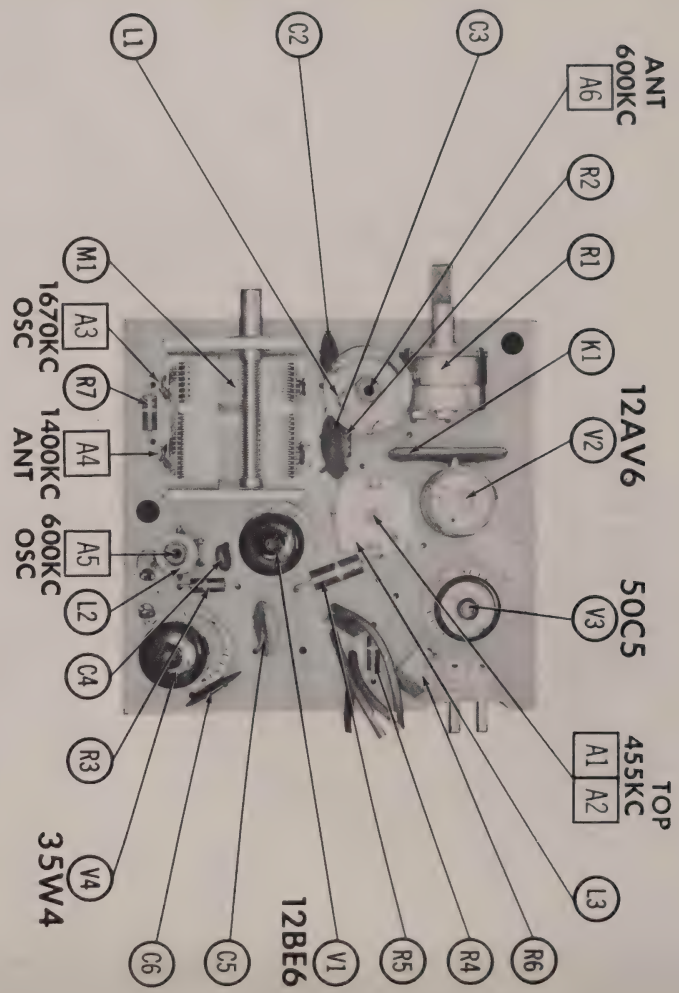
NAME	PART NO.	DESCRIPTION
Knob Knob Cabinet	43626-49 43625-49 47138-49	Tuning Volume

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

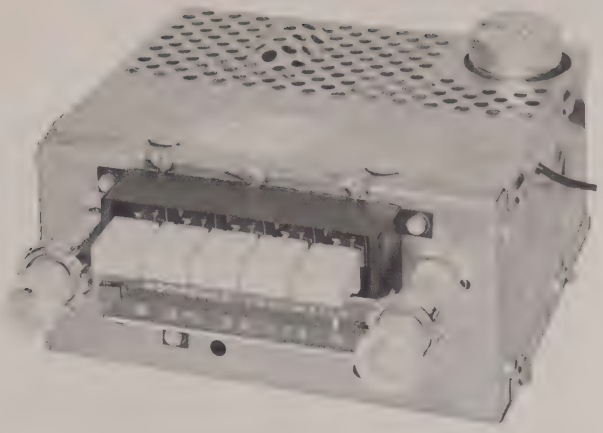
Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT® Folder

MOTOROLA
MODEL VWA8



TRADE NAME	Motorola Model VWA8 (For 1958 Volkswagen)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 6 Tube Custom Built Automobile AM Receiver
POWER SUPPLY	6 Volt Storage Battery
TUNING RANGE—BROADCAST	540 —1610KC RATING 5.4 Amp. @6.3 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7.... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A9, A10.... GENERAL CEMENT #8271, 8279, 8897, 9050-L, 9150
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Antenna receptacle thru dummy (Fig. 1).	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9 and A10) out of coils. Repeat Step 2.					
3.	Antenna receptacle thru dummy (Fig. 1).	1200KC	Tuner carriage 9/32" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Step 2.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Tune manually to desired station.
2. Pull button out; press in firmly.
3. Repeat for remaining buttons.

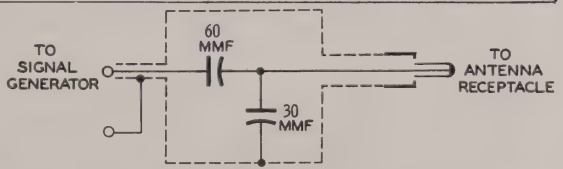


FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JD859

MOTOROLA
MODEL VWA8
MOTOROLA
MODEL VWA8
SET 486 FOLDER 17

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆	GENERAL ELECTRIC ◆	RAYTHEON ◆	SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	6BA6
V2	Converter	6BE6
V3	IF Amplifier	6BA6
V4	Det. -AVC-AF Amp.	6CR6
V5	Output	6AQ5A
V6	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■15	300	23A485677	AFH3-104	C0770	FP328	TMT-89	TVL-3620	
B	▲10	300							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	40-430	#20K542441			PM6D3	6DP-1-302	GEM-1623	6TM-D3
C3	.003 200V 10%		V84C6D3-10%			424		
C4	20-120	#20K542018						
C5	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C6	.05 200V		P288N-05	DD-503	CUB3S5	4DP-3-503	GEM-415	2TM-S5
C7	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C8	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C9	100 N750 10%		N750-DI 100	DTN-100	C10Q1U	CCTN-101	CN7-310	10TCU-T10
C10	310-390	#20K542092						
C11	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	.01 400V		P488N-01	D6-103	CUB4S1	4DP-3-103	GEM-411	4TM-S1
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C15	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C16	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C17	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C18	.004 600V		P688N-004	D6-402	CUB6D4	6DP-1-402	GEM-624	6TM-D4
C19	.02 1000V		P1088N-02		CUB10S2	16DP-4-203	GEM-1012	10TM-S2
C20	.5 100V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C21	.5 100V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5

Motorola Part Number.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		18B542013	F1-41	RTV-639C			Tone
B	2meg			R2-72	Not Req.	† QJ-1086A	■ UE1499-S	Volume
	1meg Tap							
C	Switch			KR-4	Not Req.			Power Off-On

† "Concentrikit" equivalent: K-6 Kit with base elements & shafts: B13-133, P13-122 (Panel) B18-139X, R1-105 (Rear) 76-1 (Switch)

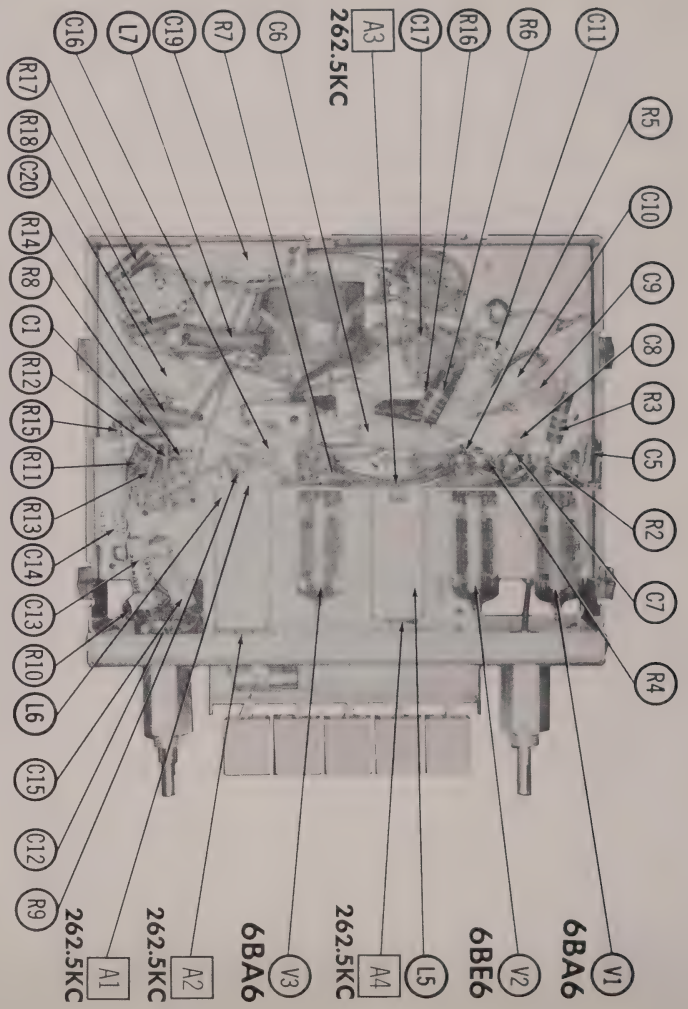
■ "STA-LOC" equivalent: FA55A, RU26T16, OS1678, IS2187, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	18K 1W	
R4	22K	
R5	330K	
R6	6800Ω 2W	
R7	270Ω	
R8	3.3meg	
R9	22K	
R10	47K	
R11	3.3meg	
R12	220K	
R13	1meg	
R14	2200Ω 2W	
R15	270Ω	
R16	330K	
R17	56Ω	
R18	56Ω	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke	24K537545						① 1.8uh
L2	Ant. Coil	24C535458						
L3	RF Coil	24C535458						
L4	Osc. Coil	24C535456						
L5	Input IF Trans.	24K542491	16-6752	16-6752	BC-350	12-H1	RF-3	
L6	Output IF Trans.	24K542675	16-6754	16-6754	BC-354	12-H6		
L7	Hash Choke	24A538914						10.3uh
L8	A Lead Hash Choke	24K542019						1.7uh

① IRC Part # CL-1.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	6.3VCT @ 2.7A	400 VCT @ .040A		25C537164B①						

① Alternate Part #25C537164.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5200Ω	3-4Ω	25B70171-P	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	50C634230	5A07	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	6.3V	115v	48B3333	5342	903M	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A 32V	65R16248	9K541991	307009 (SFE 9A 32V)	155009	SFE 9	HRH

MISCELLANEOUS

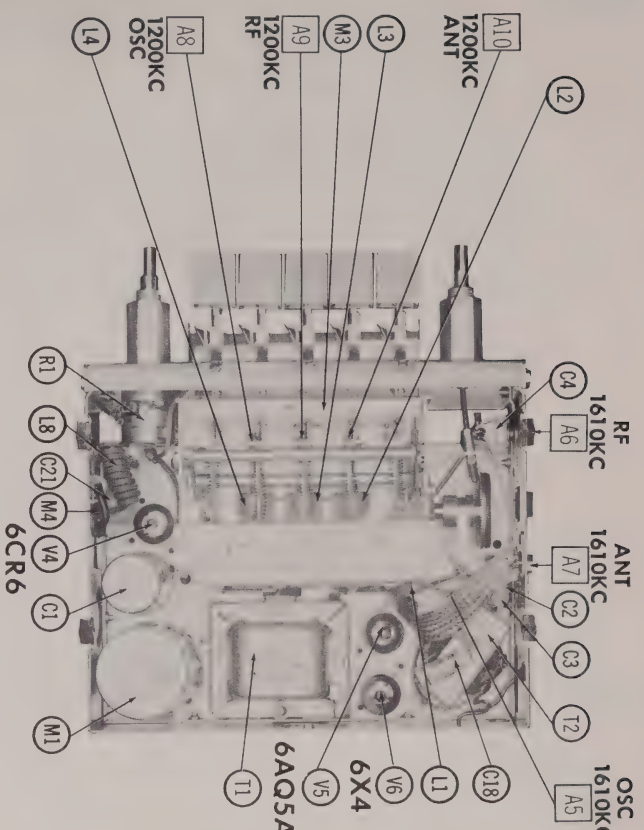
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuner	77K542165	Complete (AT-233)
M4	Spark Plate	64K530177	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

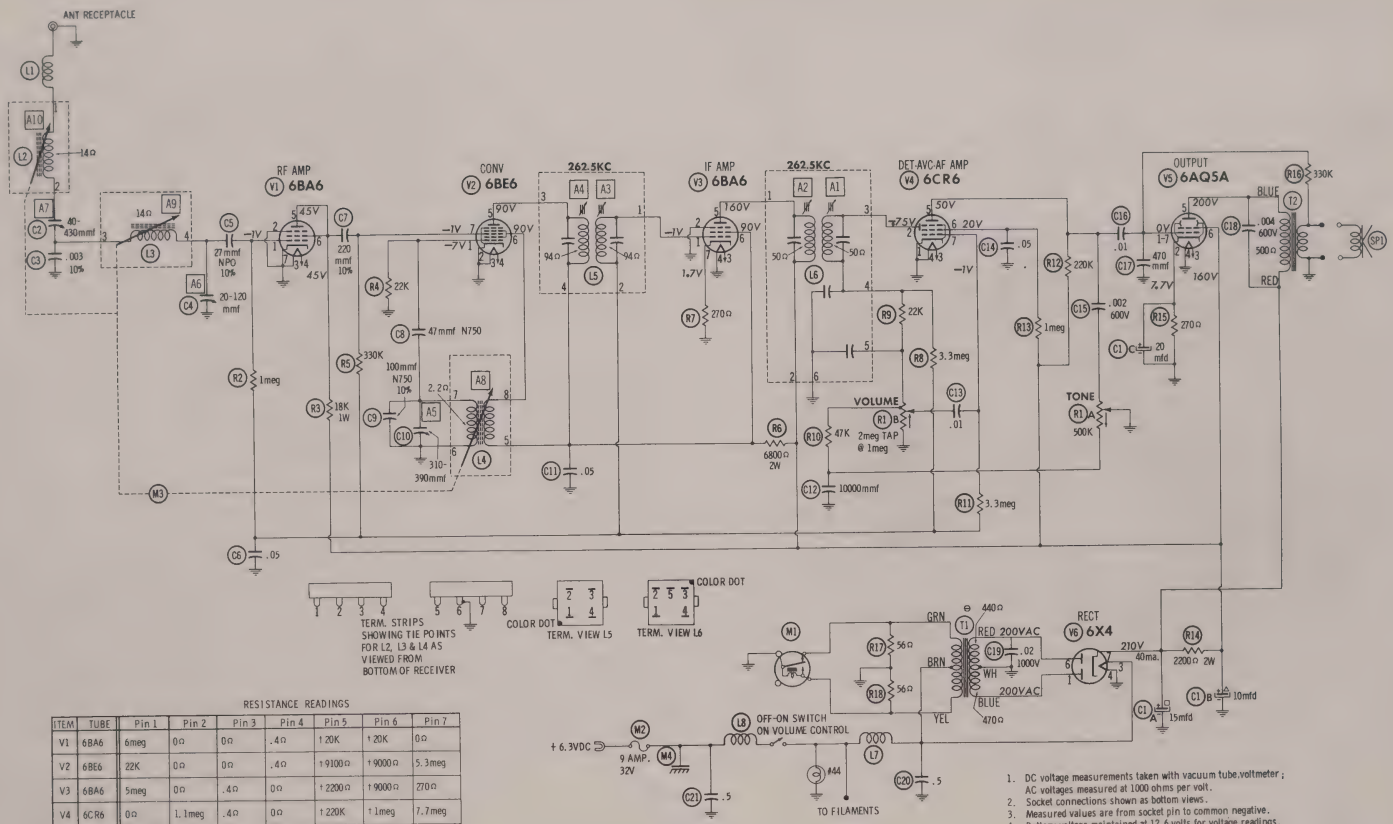
NAME	PART NO.	DESCRIPTION
Knob	36K542973	Tuning, Volume
Knob	36B522020	Tone
Knob	36K542005	Dummy
Pushbutton	38K542956	
Dial Pointer	1V542214	
Dial Scale	34B542775	

CHASSIS—TOP VIEW



WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BA6	6meg	0Ω	0Ω	.4Ω	†20K	†20K	0Ω
V2	6BE6	22K	0Ω	0Ω	.4Ω	†9100Ω	†9000Ω	5.3meg
V3	6BA6	5meg	0Ω	.4Ω	0Ω	†2200Ω	†9000Ω	270Ω
V4	6CR6	0Ω	1.1meg	.4Ω	0Ω	†220K	†1meg	7.7meg
V5	6AQ5A	330K	270Ω	.4Ω	0Ω	†500Ω	†2200Ω	330K
V6	6X4	470Ω	NC	.4Ω	0Ω	NC	440Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF Vo.
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOTOROLA
MODEL VWA8

PHOTOFACT® Folder with CIRCUITRACE®

MOTOROLA MODELS X12A-1, X12E-1 (Ch. HS-789-1, -2)

MOTOROLA MODELS X12A-1, X12E-1 (Ch. HS-789-1, -2)

MODEL X12A-1

MOTOROLA MODELS X12A-1, X12E-1 (Ch. HS-789-1, -2)

TRADE NAME	Motorola Models X12A-1, X12E-1 (Ch. HS-789-1, HS-789-2)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
RATING	7MA @ 6 volts DC (No Signal, Min. Volume) 15MA @ 6 volts DC (Signal Normal Volume)
TUNING RANGE - BROADCAST	535 - 1620 KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3, A5 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A4, A6 ..... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	600KC	Tuning to 600KC signal	"	A5	"
4.	"	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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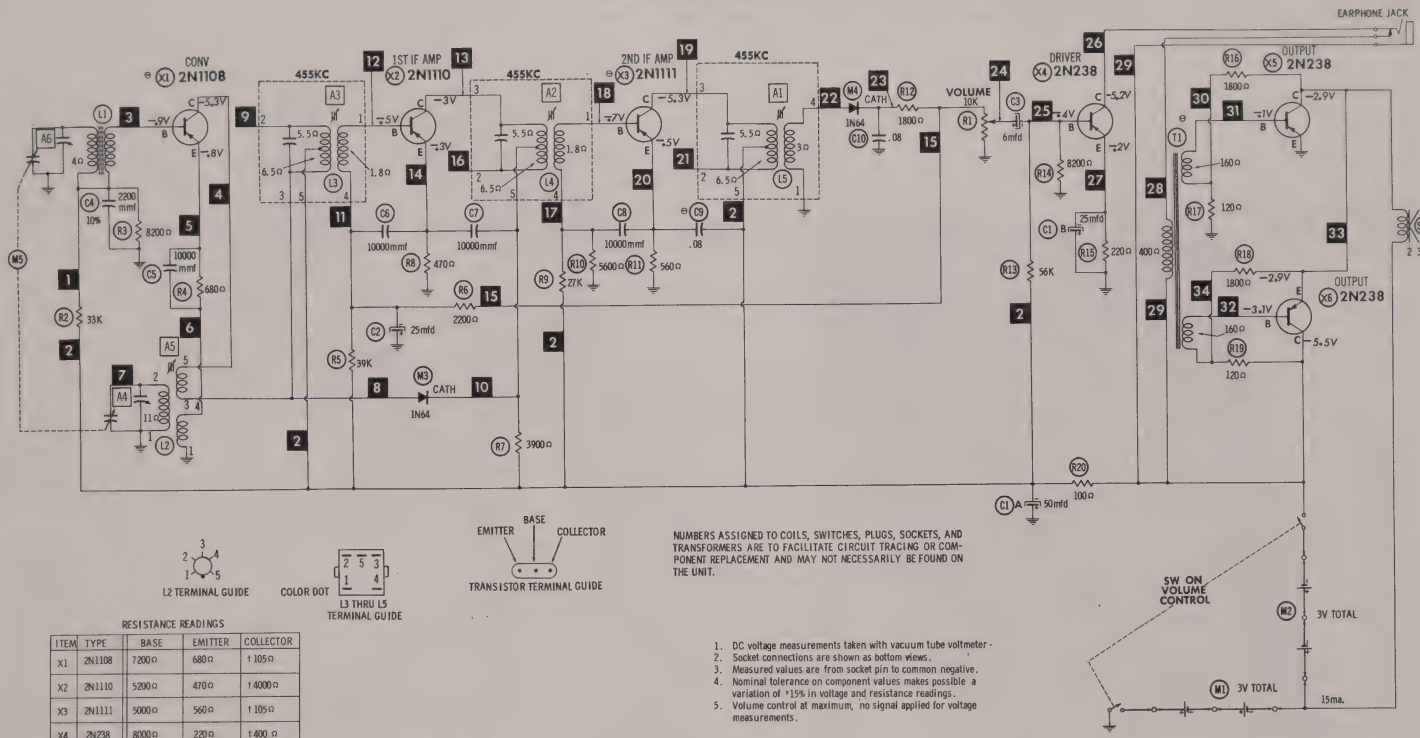
JF819

SET 486 FOLDER 18



L2 TERMINAL GUIDE

COLOR DOT

L3 THRU L5 TERMINAL GUIDE

EMITTER BASE COLLECTOR

TRANSISTOR TERMINAL GUIDE

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N1108	7200Ω	680Ω	†105Ω
X2	2N1110	5200Ω	470Ω	†4000Ω
X3	2N1111	5000Ω	560Ω	†105Ω
X4	2N238	8000Ω	220Ω	†400Ω
X5	2N238	280Ω	0Ω	†1000Ω
X6	2N238	1300Ω	1000Ω	†0Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R20 AND R19.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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MOTOROLA MODELS X12A-1, X12E-1 (Ch. HS-789-1, -2)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1108 *	Converter		2N412	2N486	2N412	PNP
X2	2N1110	1st IF Amplifier		2N409	2N483	2N409	PNP
X3	2N1111 ♦	2nd IF Amplifier		2N409	2N483	2N409	PNP
X4	2N238	Driver		2N407	2N362	2N407	PNP
X5	2N238	Output		2N407	2N632	2N407	PNP } Matched Pair
X6	2N238	Output		2N407	2N632	2N407	PNP }

Chassis HS-789-2 may use a 2N1108 coded red in this application.
Chassis HS-789-2 may use a 2N1111 coded red in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	50	10	23B639917	BCD10X5030	ECPAP9	PET2365C		VL-2250	
B	25	10							
C2	25	3	23K637758	PWE3025	EC25-3	TT3X25	ML25-3	TE-1055	
C3	6	10	23K642111	XPP-10006	NLW6-15	TT10X6	ML6-15	TE-1127.1	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA					
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	2200	10%		DI-2200			CCD-222	GP222	10TS-D22
C5	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	10000			BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C9	.08	50V	#8R129204 *						2WF-S82
C10	.08	50V	#8R129204						2WF-S82

Motorola Part Number
* Some versions may use .1mfd @ 50 V in this application. When replacing use .08mfd @ 50 V.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	10K	1/4	18B645670					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

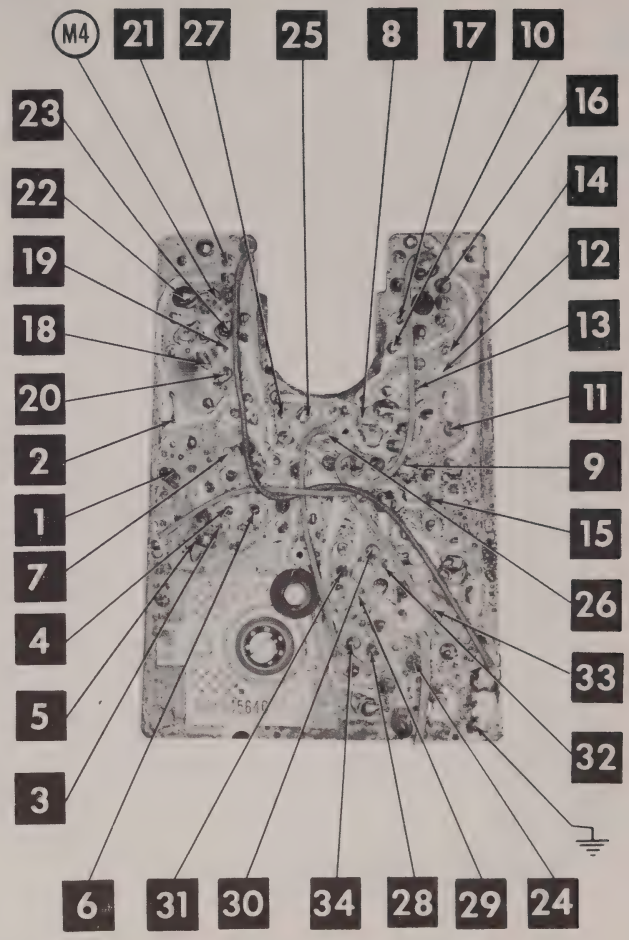
ITEM No.	RATING	REMARKS
R2	33K	
R3	8200Ω	
R4	680Ω	
R5	39K	
R6	2200Ω	
R7	3900Ω	
R8	470Ω	

ITEM No.	RATING	REMARKS
R9	27K	
R10	5600Ω	
R11	560Ω	
R12	1800Ω	
R13	56K	
R14	8200Ω	
R15	220Ω	

ITEM No.	RATING	REMARKS
R16	1800Ω	
R17	120Ω	
R18	1800Ω	
R19	120Ω	
R20	100Ω	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo



MOTOROLA MODELS X12A-1, X12E-1 (Ch. HS-789-1, -2)

FOLDER 18

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	24K643975						
L2	Osc. Coil	24K643917						
L3	1st IF Trans.	24C643727						
L4	2nd IF Trans.	24C643727						
L5	3rd IF Trans	24K643729						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	1	25B645617 ①						① Alternate part #25B 645617-A
		SEC. 2							
		1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	2 3/4"	PM	36-38Ω	50B645676	27A06Z40	

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1. 5V			930 *		1015 *		M-15R *	*2 Required
M2	1. 5V			930 *		1015 *		M-15R *	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N64	48K640 754	1N64	1N60	1N64	AVC, Overload (Pigtail)
M4	1N64	48K640 754	1N64	1N60	1N64	Detector (Pigtail)

MISCELLANEOUS

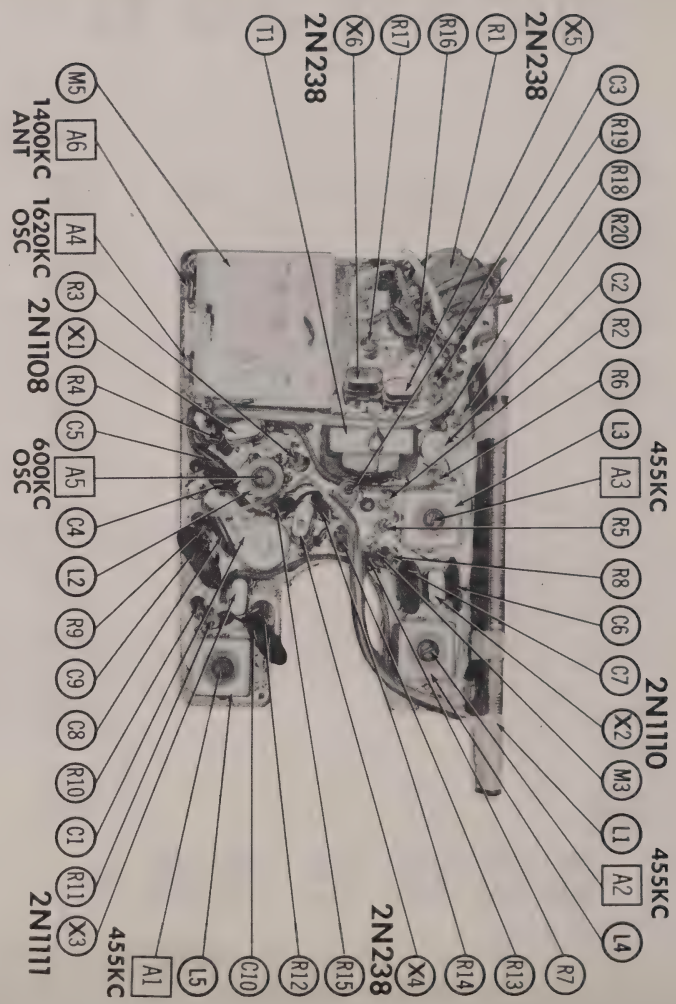
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5	Tuning Cap.	19B643442	2 gang
	Printed Board	84K645640	Less All Components (specify suffix, if listed)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C643395	Tuning
Knob	36B643396	Volume
Escutcheon	1V644554	Includes Tuning Lens
Cabinet Front	1V645693	Gray (Model X12A-1)
Cabinet Front	1V645694	Smoke (Model X12E-1)
Cabinet Back	1V645691	Gray (Model X12A-1)
Cabinet Back	1V645692	Smoke (Model X12E-1)

CHASSIS—TOP VIEW



PHOTOFACT® Folder

OLSON MODEL RA-323

OLSON MODEL RA-323

OLSON MODEL RA-323

TRADE NAME	Olson Model RA-323
SUPPLIER	Olson Radio Corp., 260 S. Forge Street, Akron 8, Ohio
TYPE SET	AC-DC Operated AM Receiver
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 25 Watts, .25 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	530 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A5, A6. . GENERAL CEMENT #8721, 8722
WALSCO #2519
A4, A7. . . . . GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum deflection.
2.	"	1620KC	"	"	A4	"
3.	Loop	600KC	600KC	"	A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.	"	1400KC	Tune to 1400KC signal.	"	A7	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Det. -AVC-AF Amp.	12AV6
V4	Output	50C5
V5	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS3600	BBRT42215	TCT3114	TDLT-3	TVA-3448	
B	20	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S2
C3	250 10%		NPO-SI 240	D6-251	L10T25	CCD-251	GP325	10TS-T25
C4	70 10%		NPO-SI 75	D6-750	L10Q75	CCD-750	GP475	10TS-Q75
C5	10 10%		NPO-SI 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C6	250 10%		NPO-SI 240	D6-251	L10T25	CCD-251	GP325	10TS-T25
C7	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C8	250 10%		NPO-SI 240	D6-251	L10T25	CCD-251	GP325	10TS-T25
C9	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C10	.005 600V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C11	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	1meg	½						Volume & Switch

RESISTORS

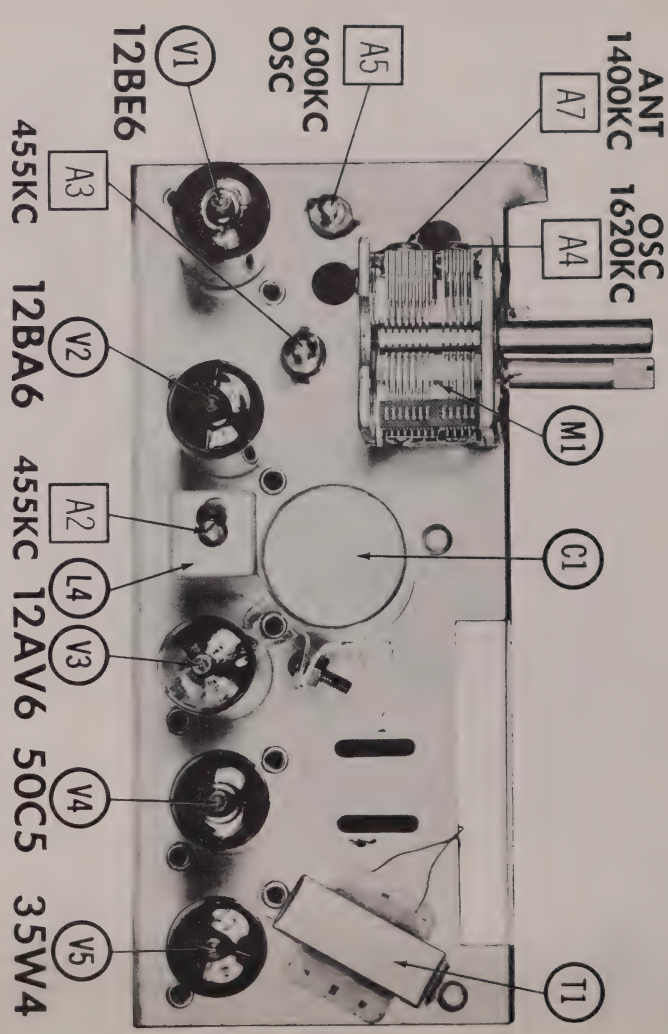
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	20K	
R3	100K	
R4	2meg	

ITEM No.	RATING	REMARKS
R5	3meg	
R6	250K	
R7	500K	

ITEM No.	RATING	REMARKS
R8	150Ω	
R9	3000Ω 2W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLSON PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3 L4	Loopstick Osc. Coil 1st IF Coil 2nd IF Trans.					2007 70-OSC *		* Disregard sec.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLSON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2000Ω	6-8Ω		26S58	A-3025①	AU-605①		26S58	S-12X①	① Drill New Mounting Hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLSON PART No.	QUAM PART No.	
SP1	3½"	PM	6-8Ω		3A05Z7.9	

MISCELLANEOUS

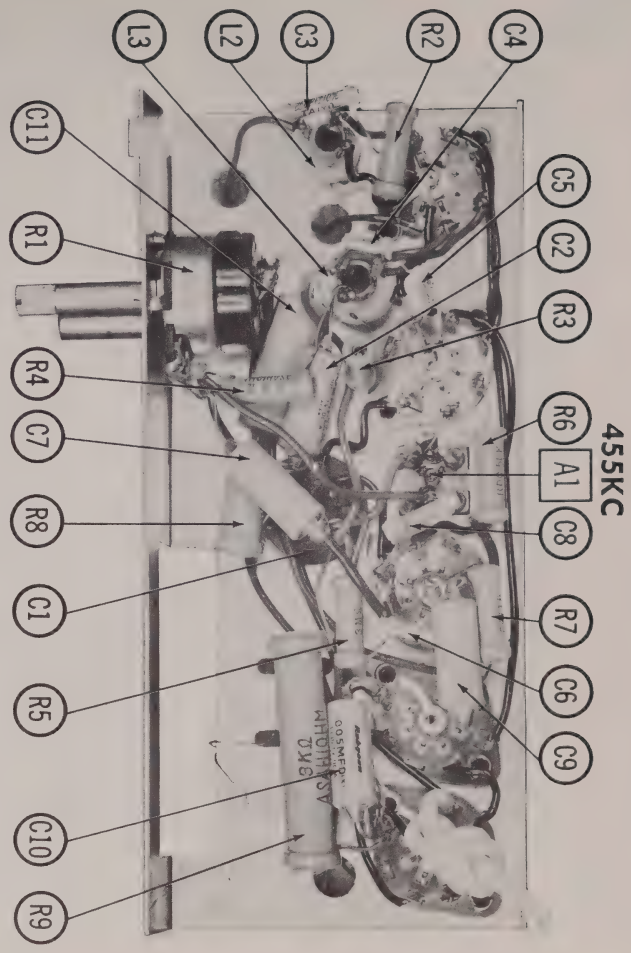
ITEM No.	PART NAME	OLSON PART No.	NOTES
M1	Tuning Cap.		2 Gang; (Ant. 10-211mmf, Osc. 9-91mmf)

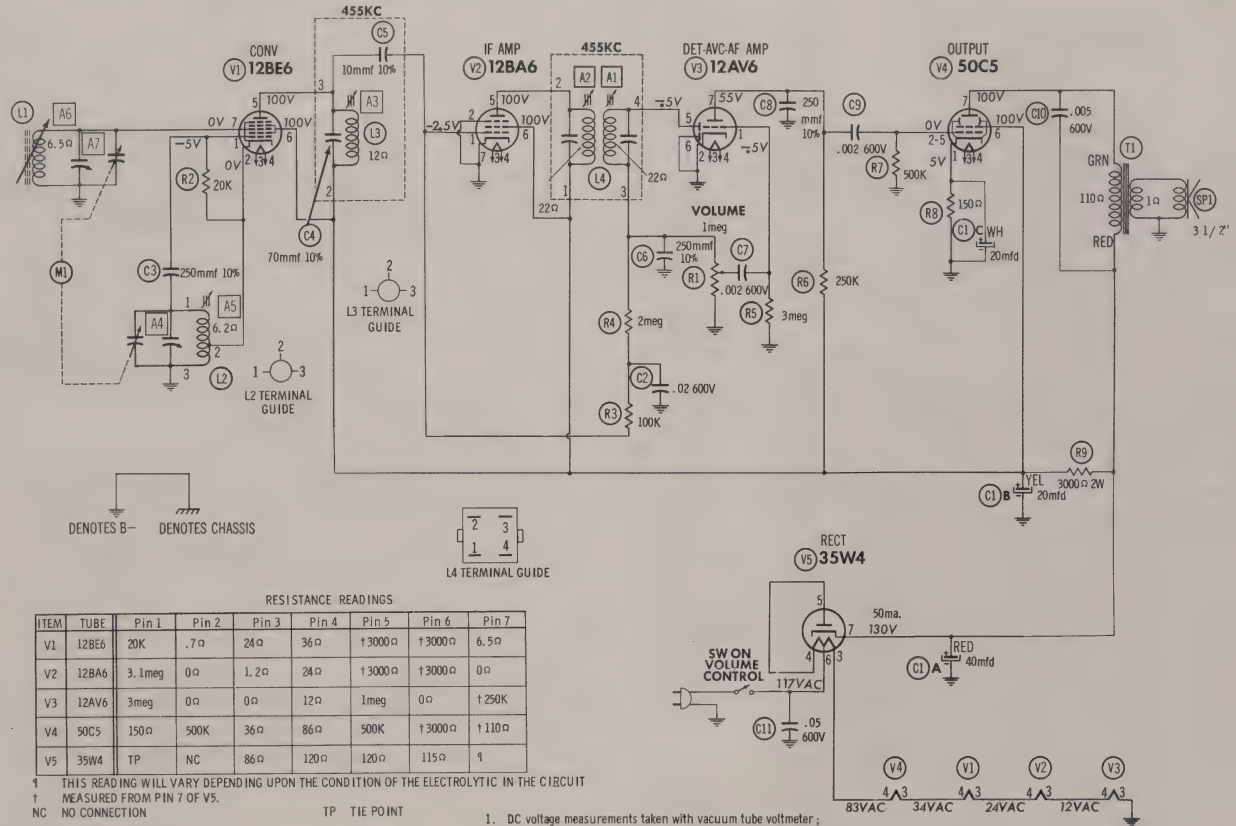
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	20K	.7Ω	24Ω	36Ω	†3000Ω	†3000Ω	6.5Ω
V2	12BA6	3.1meg	0Ω	1.2Ω	24Ω	†3000Ω	†3000Ω	0Ω
V3	12AV6	3meg	0Ω	0Ω	12Ω	1meg	0Ω	†250K
V4	50C5	150Ω	500K	36Ω	86Ω	500K	†3000Ω	†110Ω
V5	35W4	TP	NC	86Ω	120Ω	120Ω	115Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

OLSON MODEL RA-323

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT® Folder with CIRCUITRACE®

PHILCO MODEL H-973

PHILCO MODEL H-973

PHILCO MODEL H-973

TRADE NAME	Philco Model H-973
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.
TYPE SET	AC-DC Operated 6 Tube AM Receiver
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles
TUNING RANGE—BROADCAST	535 - 1620KC RATING 26 Watts, .25 Amp. @117 Volts AC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1 thru A4, A8..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to B-.	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	Place 6 mil shim between rotor and stator turn rotor until shim is held in place. Remove shim.	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1520KC	Tune to 1520KC signal.	"	A6, A7	"
4.	"	580KC	Tune to 580KC signal.	"	A8	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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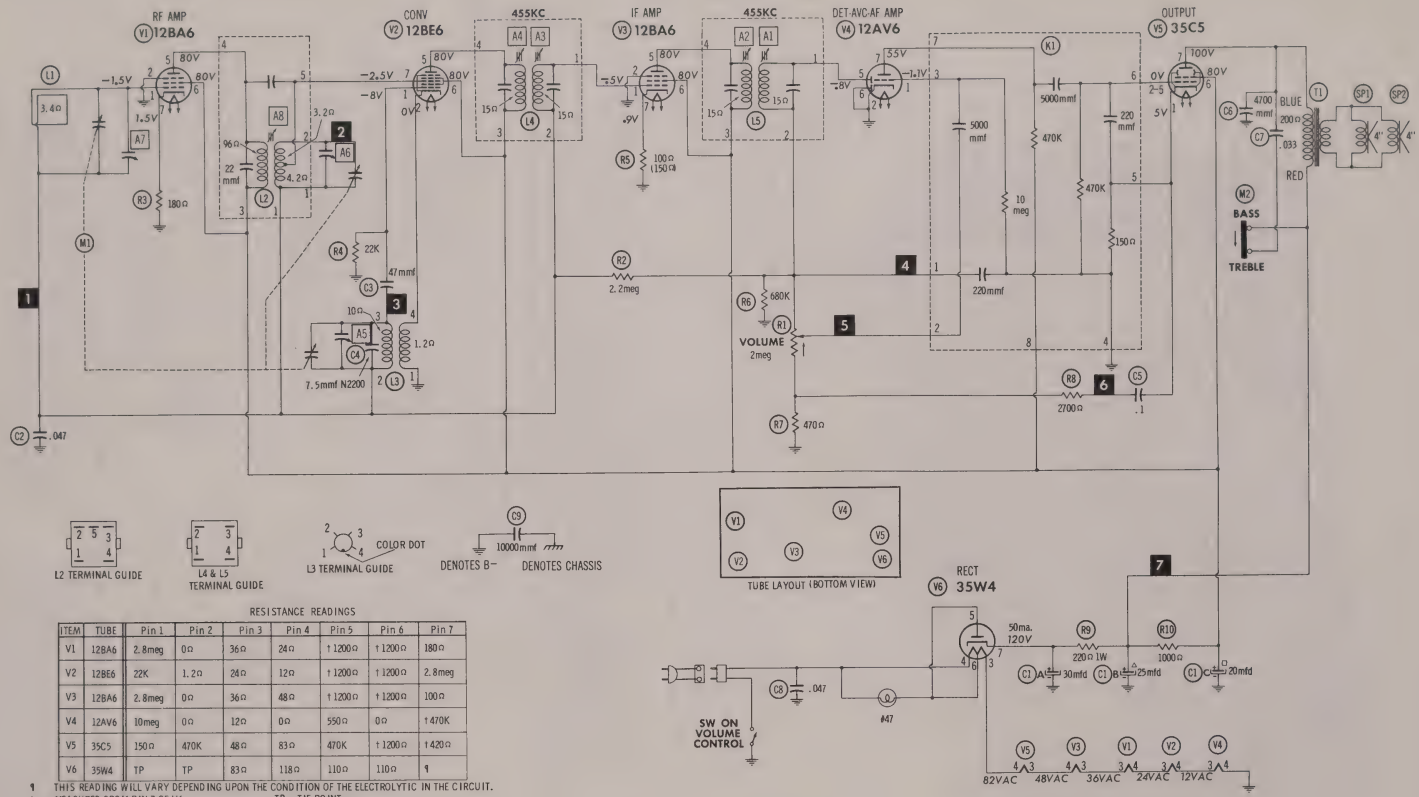
JG665

SET 486 FOLDER 20



L2 TERMINAL GUIDE

L4 & L5 TERMINAL GUIDE

L3 TERMINAL GUIDE

COLOR DOT

DENOTES B−

DENOTES CHASSIS

TUBE LAYOUT (BOTTOM VIEW)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	2.8meg	0Ω	36Ω	24Ω	†1200Ω	†1200Ω	180Ω
V2	12BE6	22K	1.2Ω	24Ω	12Ω	†1200Ω	†1200Ω	2.8meg
V3	12BA6	2.8meg	0Ω	36Ω	48Ω	†1200Ω	†1200Ω	100Ω
V4	12AV6	10meg	0Ω	12Ω	0Ω	550Ω	0Ω	†470K
V5	35C5	150Ω	470K	48Ω	83Ω	470K	†1200Ω	†420Ω
V6	35W4	TP	TP	83Ω	118Ω	110Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6. TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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with CIRCUITRACE®

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NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

PHILCO MODEL H-973

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	RF Amplifier	12BA6
V2	Converter	12BE6
V3	IF Amplifier	12BA6
V4	Det. -AVC-AF Amp.	12AV6
V5	Output	35C5
V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	30	150	30-2585-2	PWH3-05-50	C0080+	PFP311.63	TDLT-2	PCL-3455	
B	▲25	150							
C	■20	150							

+ Use printed circuit adaptor #55277 and 55278.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C3	47		NPO-SI 47	TCZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C4	7.5 N2200	#30-1224-83				*		
C5	.1 200V		P288N-1	DF-104	CUB2P1	2DP-2-104	GEM-201	2TM-P1
C6	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C7	.033 400V		P488N-033	DD-303	CUB4S33	4DP-2-333	GEM-4133	4TM-S33
C8	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10

Philco Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	1/2	33-5575-21					Volume
B	Switch							Push-Pull Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	2.2meg	
R3	180Ω	
R4	22K	
R5	100Ω	(150Ω) *
R6	680K	
R7	470Ω	
R8	2700Ω	
R9	220Ω 1W	
R10	1000Ω	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PHILCO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Ant.	76-11463-2						
L2	RF Trans.	32-4723-1						
L3	Osc. Coil	32-4693-6						
L4	1st IF Trans.	32-4583-16	16-6780	16-6780	BC-356	13-PC1	RF-4	
L5	2nd IF Trans.	32-4583-17	16-6780	16-6780	BC-357	13-PC2	RF-4	

PRINTED BOARD

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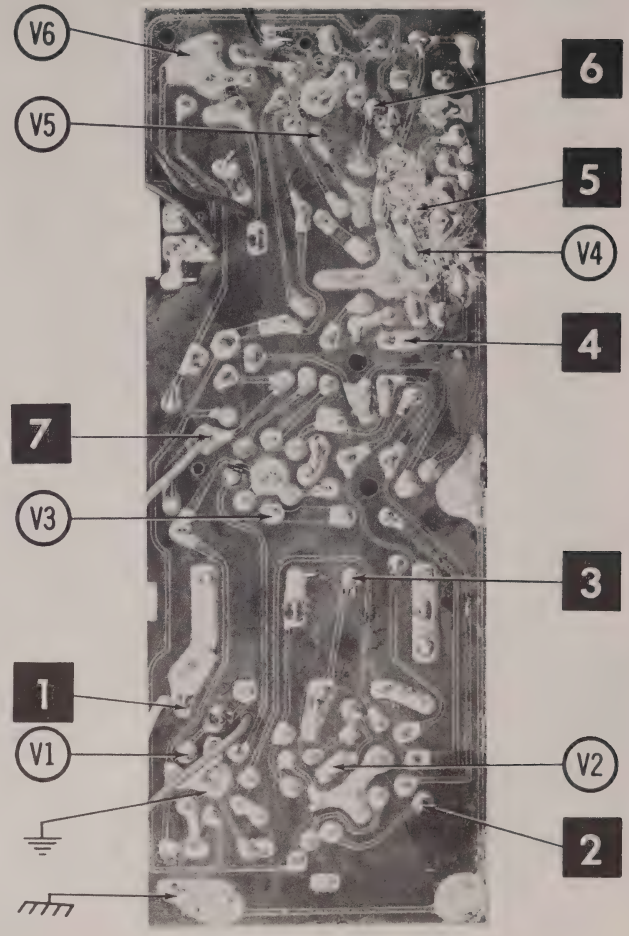
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	1-2Ω	Part of SP1	24S48				24S48		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	36-1655-12 *	4A07	* Includes Output Transformer (T1)
SP2	4"	PM	3-4Ω	36-1655-3	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PHILCO PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 220mmf, 5000mmf, 5000mmf, 150Ω, 470K, 470K, 10meg	30-6500-1	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1	Tuning Cap	31-2787-2	3 Gang
M2	Switch	42-2119-1	Tone (SPDT Slide Type)
	Printed Board	54-6394-4	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

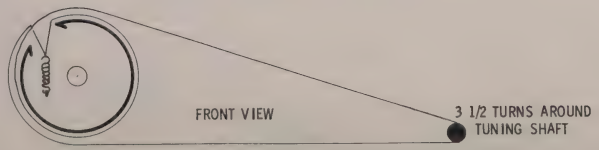
NAME	PART NO.	DESCRIPTION
Knob	54-6653-3	Tuning , Volume
Pointer	54-6396-1	
Dial Scale	54-6409-4	
Cabinet	51-0085-3	Ivory
Cabinet	51-0085-1	Mahogany

WIRING DATA

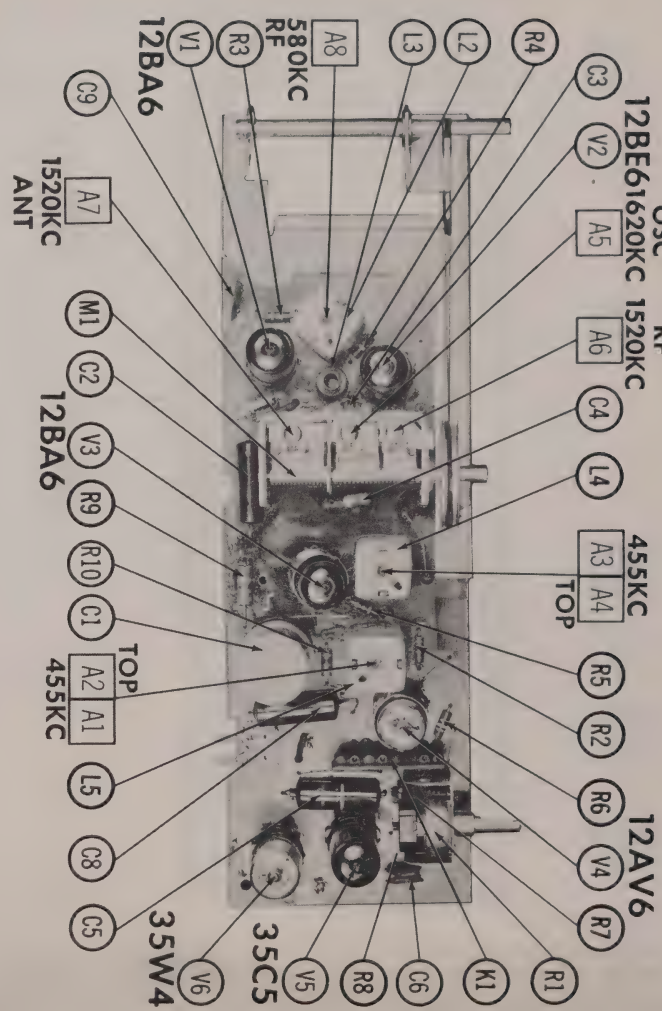
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

DIAL CORD STRINGING



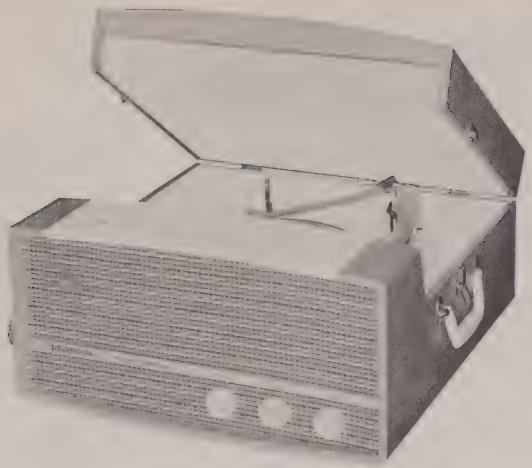
CHASSIS—TOP VIEW



PHOTOFACT® Folder

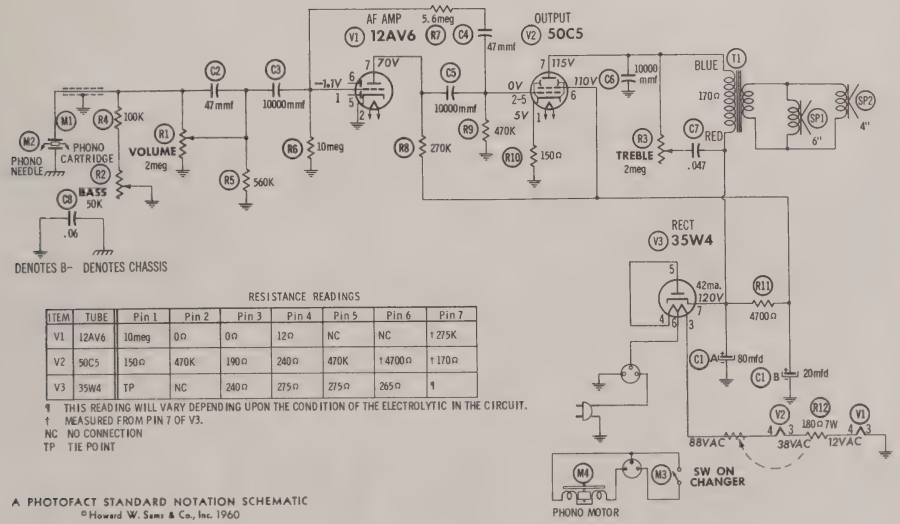
PHONOLA MODEL 859

PHONOLA MODEL 859



TRADE NAME	Phonola Model 859
MANUFACTURER	Waters Conley Co., Inc., Rochester, Minn.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 25 Watts, .24 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13771 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AV6	10meg	0Ω	0Ω	12Ω	NC	NC	†275K
V2	50C5	150Ω	470K	190Ω	240Ω	470K	†4700Ω	†170Ω
V3	35W4	TP	NC	240Ω	275Ω	275Ω	265Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION
TP TIE POINT

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JS797

SET 486 FOLDER 21

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	AF Amplifier	12AV6
V2	Output	50C5
V3	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	12018	PRS2220	C0080	TCD4975	TDLD-10	TVLS-2440.8	*
B	20	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C4	47		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C8	.06 200V		P288N-06		CUB6S6	6DP-4-603	GEM-4l6	6TM-S6

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg	½	12400					Volume
R2	50K	½	12401					Bass
R3	2meg	½	12400					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	560K	
R6	10meg	

ITEM No.	RATING	REMARKS
R7	5.6meg	
R8	270K	
R9	470K	

ITEM No.	RATING	REMARKS
R10	150Ω	
R11	4700Ω	
R12	180Ω 7W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2100Ω	1-2Ω	11876	24S05				24S05		

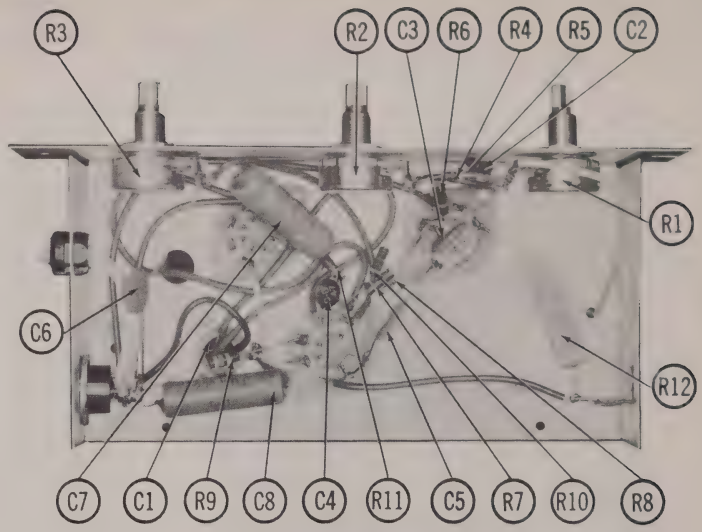
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	PHONOLA PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	11505	6A1	
SP2	4"	PM	3-4Ω	11792	4A07	

PHONO CARTRIDGE

ITEM No.	PHONOLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	12827 ①	81-T	Not Req.	81	Not Req.			1IT2-S	N-1IT2-S

① Includes Needles.



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA PHONOLA PART No.	REPLACEMENT DATA CLEVITE WALCO PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M2	* 12827		* A-4l † or * A-4lSD †♦ or * A-4lDD ♦	† Jewel ♦ Diamond * Includes Cartridge

MISCELLANEOUS

ITEM No.	PART NAME	PHONOLA PART No.	NOTES
M3	Switch		Off-On (Part of Changer)
M4	Motor		Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	13440-8E	Volume, Bass, Treble
Cabinet	859	
Handle	13056-8B	

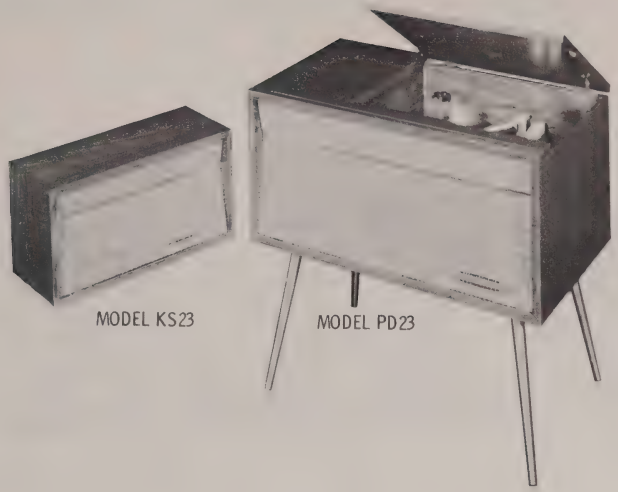
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

RCA VICTOR MODELS KS23, PD23, PD24, PM23D (Ch. RS-178, X)

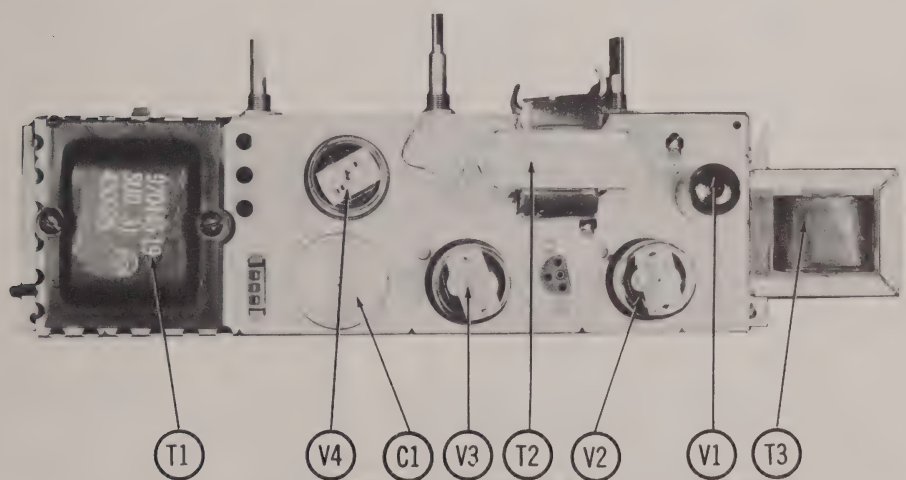
RCA VICTOR MODELS KS23, PD23, PD24, PM23D (Ch. RS-178, X)



RCA VICTOR MODELS KS23, PD23, PD24, PM23D (Ch. RS-178, X)

TRADE NAME	RCA Victor Models PD-23, PD-24 (Ch. RS-178); PM-23D (Ch. RS-178X), KS-23
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 63 Watts, .63 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE RCA RP-211 SERIES— PHOTOFACT SET 475 FOLDER 7



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 486 FOLDER 22

PARTS LIST AND DESCRIPTIONS

TUBES

CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V2	Left Channel Output	6V6GT
V3	Right Channel Output	6V6GT
V4	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲35	400	108488	AFH4-06-40	C1070	FP421.9	TMT-133	TVL-3744	
B	■35	400			BR505		TD-50-50	TVA-1308	
C	▲50	50							
D	20	25							
C2	8	10NP	100509①	PRS-AC6200	BBR16-90 †	TCN108		TVAS-1112 *	

① Two 4mfd@10VNP are used in Chassis RS-176X (Part #106353).
† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C4	.047 400V		V84C4S47-10%		PM4S47	4DP-3-473	GEM-1615	4TM-S47
C5	.01 200V		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C6	.047 200V		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C7	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C8	.047 400V		V84C4S47-10%		PM4S47	4DP-3-473	GEM-1615	4TM-S47
C9	.01 200V		V84C2S1-10%		PM4S1	4DP-1-103	GEM-1611	4TM-S1
C10	.047 200V		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K *		108487					Loudness, Right Channel
B	500K *							Loudness, Left Channel
R2A	1meg		108484					Balance
B	2meg							Bass, Right Channel
C	2meg							Bass, Left Channel
R3A	500K		108486	B-613				Treble, Right Channel
B	500K			SR-613				Treble, Left Channel

* Taps@84K & 168K.

RESISTORS

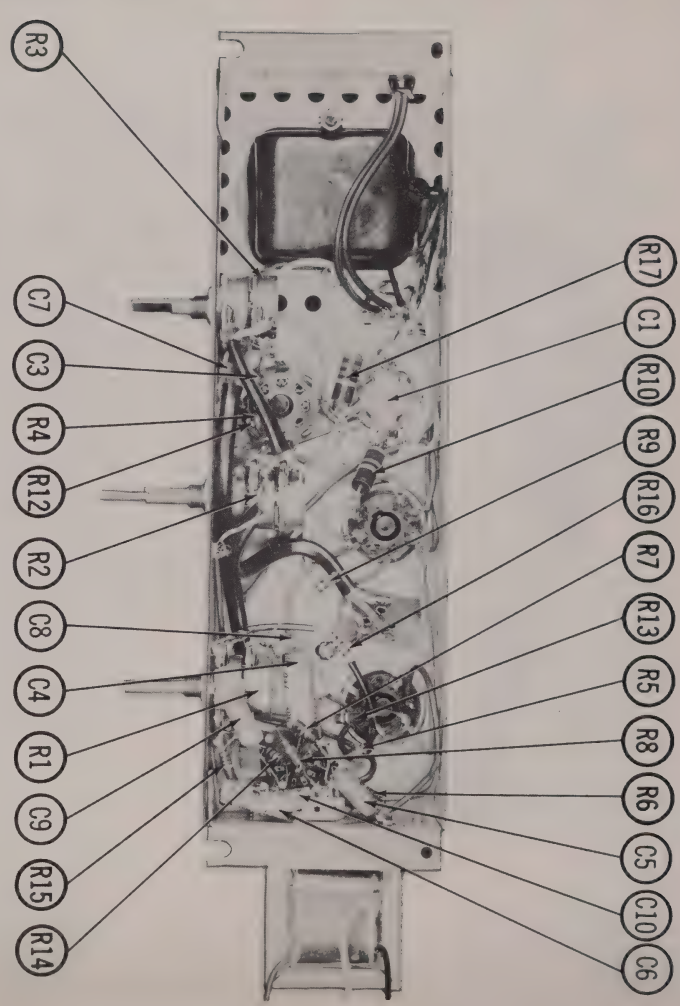
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	180K	
R5	220K	
R6	1500Ω	
R7	22K	
R8	8200Ω	

ITEM No.	RATING	REMARKS
R9	47K	
R10	150Ω 2W	
R11	33Ω 2W	
R12	180K	
R13	220K	

ITEM No.	RATING	REMARKS
R14	22K	
R15	8200Ω	
R16	47K	
R17	2200Ω 2W	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .63A	600 VCT @ .090A	5V @ 2A	108483				P-8175①		
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.2A									

① Note Mounting Changes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5500Ω	8Ω Tap @ 4Ω	108553 ①	24S92				24S92		
T3	5500Ω	8Ω Tap @ 4Ω	108553 ①	24S92				24S92		

① Alternate Part #108797 used in Chassis RS-178X.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	78597 ①	8A21	① Model PD-23. Two used in Model PM-23D.
SP2	3½"	PM	6-8Ω	105395②	3A15TZ6.4	② Models PD-23, PD-24, PM-23D
SP3	3½"	PM	6-8Ω	105395②	3A15TZ6.4	③ Speaker unit KS-23 used with Models PD-23, PD-24
SP4	8"	PM	3-4Ω	106821③		④ Model PD-24
	6½"	PM	3-4Ω	106701④	6A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	10690A	13TBX		26V	D1-1 S3-3				

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	RCA Victor PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	108215 † ♦		M-77 † or M-77D ♦ and M-77X † or M-77XD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Switch	46760	Speaker Selection (DPDT Slide Type)
M4	Switch	108457	Off-On (Part of Changer)
M5	Motor		Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	108478	Volume, Treble
Knob	108479	Bass
Knob	108477	Balance
Cabinet	X4608	Cherry, Model PD-23
Cabinet	X4604	Cherry, Model PD-24
Cabinet	X4605	Mahogany, Model PD-23
Cabinet	X4601	Mahogany, Model PD-24
Cabinet	X4607	Oak, Model PD-23
Cabinet	X4603	Oak, Model PD-24
Cabinet	X4606	Walnut, Model PD-23
Cabinet	X4602	Walnut, Model PD-24
Cabinet	X4686	Cherry, Model PM-23D
Cabinet	X4683	Mahogany, Model PM-23D
Cabinet	X4685	Oak, Model PM-23D
Cabinet	X4684	Wainut, Model PM-23D
Cabinet Leg	Z5130	Model PD-23
Cabinet Leg	Z5131	Model PD-24
Cabinet Leg	Z5155	Model PM-23D
Cabinet Lid	X5090	Cherry, Model PD-24
Cabinet Lid	X5087	Mahogany, Model PD-24
Cabinet Lid	X5089	Oak, Model PD-24
Cabinet Lid	X5088	Walnut, Model PD-24
Cabinet Door	X5154	Cherry (Matched Pair) Model PM-23D (Less Hardware)
Cabinet Door	X5151	Mahogany (Matched Pair) Model PM-23D (Less Hardware)
Cabinet Door	X5153	Oak (Matched Pair) Model PM-23D (Less Hardware)
Cabinet Door	X5152	Walnut (Matched Pair) Model PM-23D (Less Hardware)

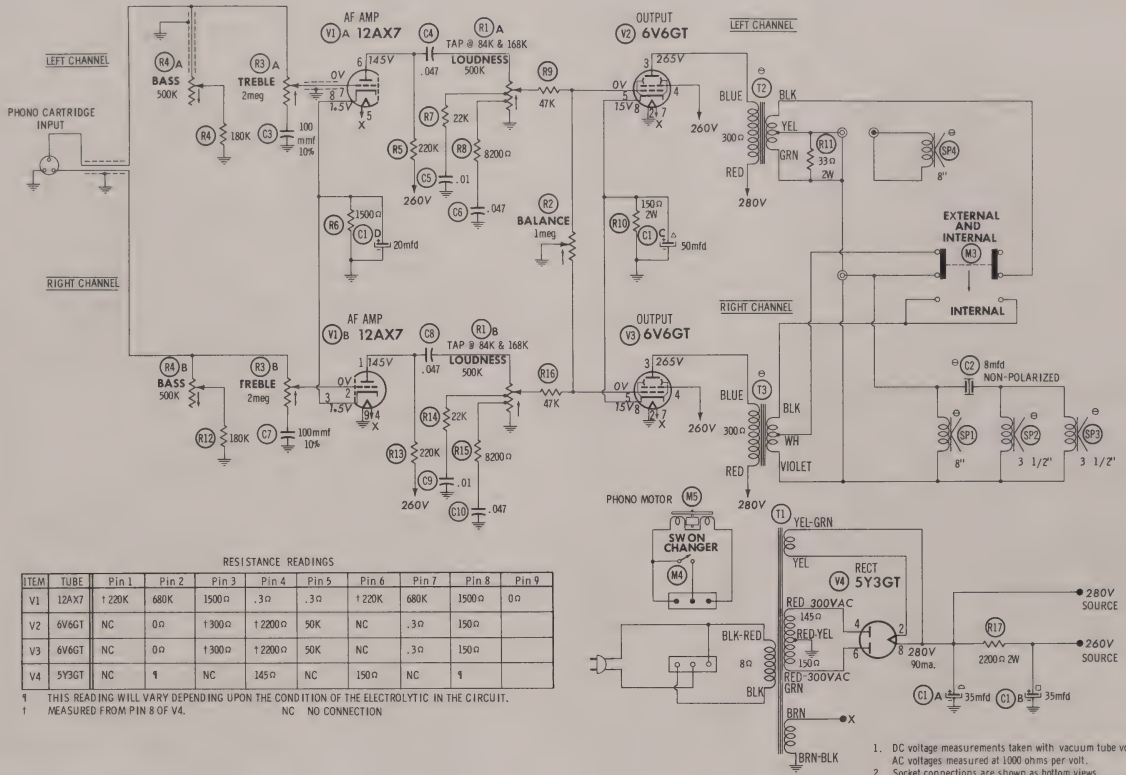
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†220K	680K	1500Ω	.3Ω	.3Ω	†220K	680K	1500Ω	0Ω
V2	6V6GT	NC	0Ω	†300Ω	†2200Ω	50K	NC	.3Ω	150Ω	
V3	6V6GT	NC	0Ω	†300Ω	†2200Ω	50K	NC	.3Ω	150Ω	
V4	5Y3GT	NC	¶	NC	145Ω	NC	150Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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RCA VICTOR MODELS KS23, PD23, PD24, PM23D (Ch. RS-178, X)

PHOTOFACT® Folder with CIRCUITRACE®

**REALTONE
MODEL TR-555**

REALTONE
MODEL TR-555

REALTONE
MODEL TR-555

TRADE NAME	Realtone Model TR-555 (Galaxy)		
IMPORTER	Realtone Electronics, 184 Fifth Ave. New York 10, N. Y.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	9 Volts DC	RATING	8MA @ 9 Volts DC (No Signal, Min. Volume) 10MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 — 1605KC		

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

A3, A5.... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9091
WALSCO #2526, 2541, 2542, 2543, 2544

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A3	"
3.	"	600KC	600KC	"	A4	"
4.	"	1400KC	Tune to 1400 KC Signal	"	A5	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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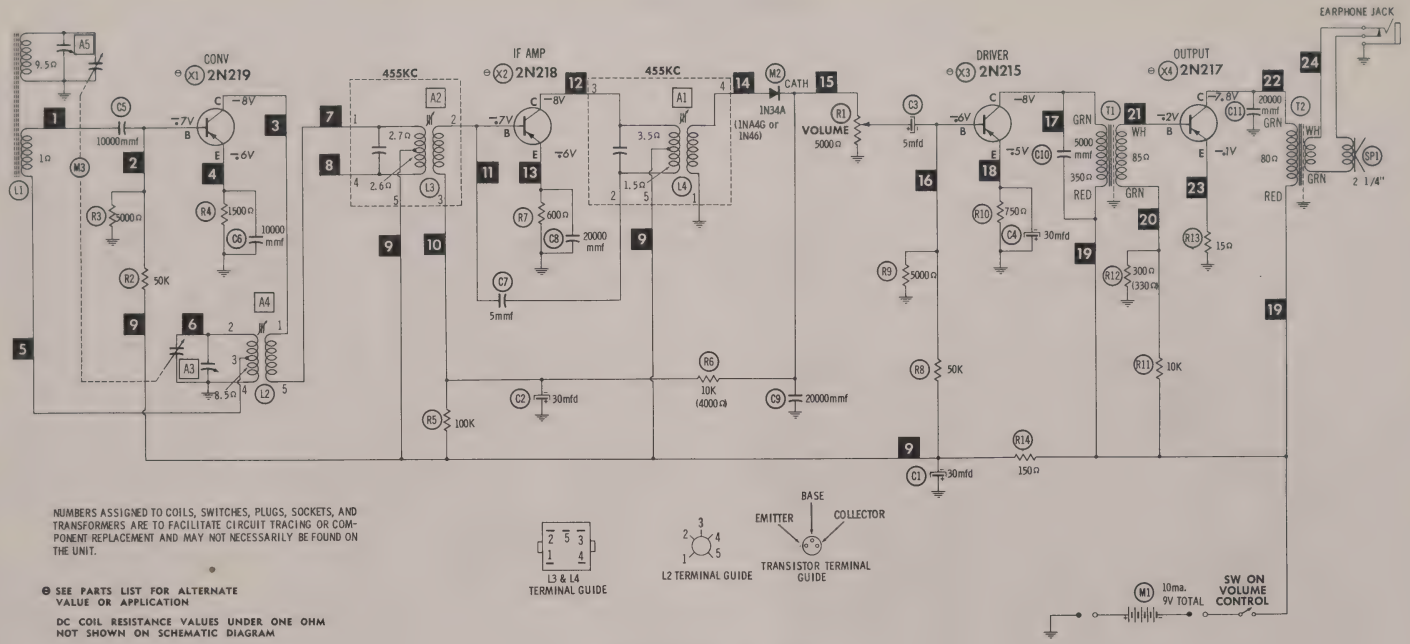
JF67I

SET 486 FOLDER 23



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE™

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REALTONE
MODEL TR-555

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N219 *	Converter		2N219	2N486		PNP
X2	2N218 ♦	IF Amplifier		2N218	2N484	2N218	PNP
X3	2N215 †	Driver		2N215	2N362		PNP
X4	2N217 ǂ	Output		2N217	2N631	2N217	PNP

* Alternate Type 2S30, 2NJ8A, or HJ-60 may be used in this application.
♦ Alternate Type 2S31, 2NJ5A, or 2N410 may be used in this application.
† Alternate Type 2S32, 2NJ9D, or HF-62 may be used in this application.
ǂ Alternate Type 2S33, 2NJ9A, or 2N408 may be used in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT.	REALTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.		
C1	30	6			NLW25-6					
C2	30	6			NLW25-6					
C3	5	3		XPP-3005	NLW5-6	TT6X5	ML5-6			
C4	30	6			NLW25-6					

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C6	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10	
C7	5		NPO-D1 5, 0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50	
C8	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C9	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	
C10	5000		C80V502AM	DDM-502	H-05D5		TA-250	TG-D50	
C11	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REALTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/8		B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	50K	
R3	5000Ω	
R4	1500Ω	
R5	100K	
R6	10K	(4000Ω) *

ITEM No.	RATING	REMARKS
R7	600Ω	
R8	50K	
R9	5000Ω	
R10	750Ω	
R11	10K	

ITEM No.	RATING	REMARKS
R12	300Ω	(330Ω) *
R13	15Ω	
R14	150Ω	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		REALTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							

PRINTED BOARD

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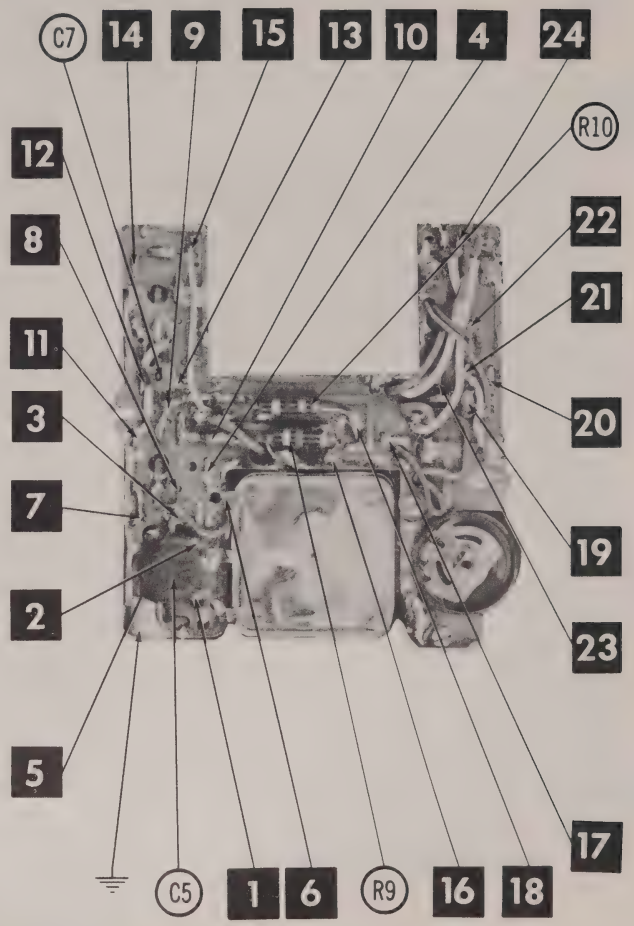


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REALTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2	1		TR-40			TR-40		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	REALTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	390Ω	8Ω		TR-19				TR-19		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	REALTONE PART No.	QUAM PART No.	
SP1	2 1/4"	PM	8-10Ω		22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	REALTONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		REALTONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N34A *		1N34A	1N34A	1N34A	Detector (Pigtail)

* Alternate Types 1NA4G, 1N46

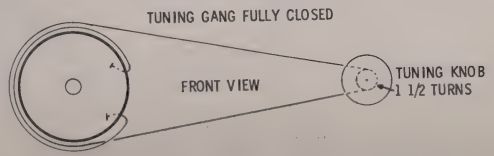
MISCELLANEOUS

ITEM No.	PART NAME	REALTONE PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 10-178mmf, Osc. 8-77mmf)

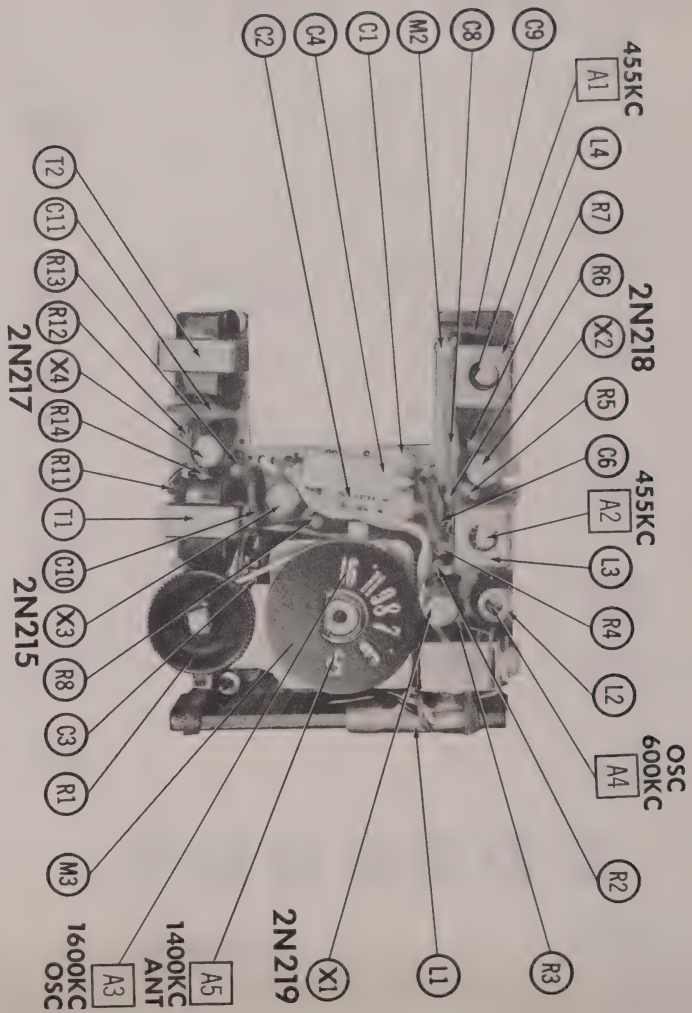
WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

DIAL CORD STRINGING



CHASSIS—TOP VIEW

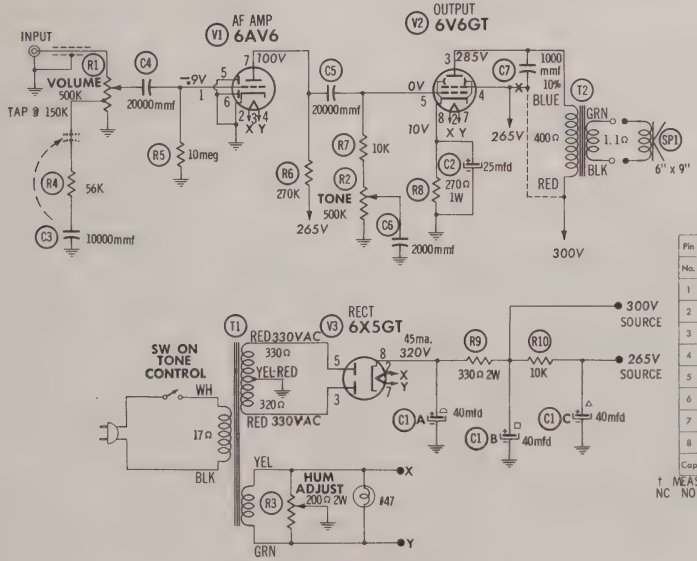


PHOTOFACT® Folder

SILVERTONE MODEL 238 (Ch. 528.59520)

SILVERTONE MODEL
238 (Ch. 528.59520)

TRADE NAME	Silvertone Model 238 (Ch. 528.59520)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 3 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts, 60 Cycles RATING 33 Watts, .35 Amp. @ 117 Volts AC



Pin No.	V1 6AV6	V2 6V6GT	V3 6X5GT
1	10meg	NC	NC
2	0Ω	50Ω	50Ω
3	50Ω	†770Ω	320Ω
4	50Ω	†10K	NC
5	NC	510K	330Ω
6	0Ω	NC	NC
7	†280K	50Ω	50Ω
8		270Ω	20K(Min)
Cap			

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODEL
238 (Ch. 528.59520)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JX626

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SET 486 FOLDER 24

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	AF Amplifier	6AV6
V2	Output	6V6GT
V3	Rectifier	6X5GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▪40	350	18-36-3	AFH3-44	C0350	FP327.89	TMT-40	TVL-3787	
B	▪40	300							
C	▪40	300							
C2	25	25	18-52-5	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C6	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C7	1000	10%	DI-1000	DD-102	IR5D1	CCD-102	GP210	10TS-D10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K 150K Tap	½	24-359-0	BT-66				Volume
R2A	500K	½	24-204-2	B-60-S				Tone
B	Switch			Not Req.				Power Off-On
R3	200Ω	2(WW)	24-1-3				FL200P	Hum Adjust

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	56K	
R5	10meg	
R6	270K	

ITEM No.	RATING	REMARKS
R7	10K	
R8	270Ω 1W	
R9	330Ω 2W	

ITEM No.	RATING	REMARKS
R10	10K	

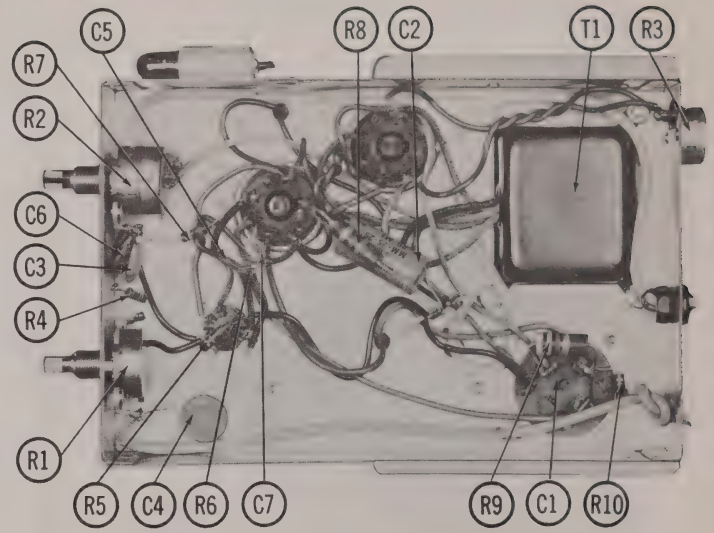
TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	660VCT	6.3V	80-34-0	24R17			PM8407	24R17	
	ⓐ .35A	ⓐ .045A	ⓐ 1.6A							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5400Ω	6-8Ω	80-105-1	24S92	A-2902①	AU-609	A-2313	24S92	S-55X	① Drill new mounting hole.

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE	FIELD	V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	6" x 9"	PM	6-8Ω	33-422-4	69A1Z7.5	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1280-0	Off-On Volume, Tone
Cabinet	42-41-4	
Handle	49-509	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

TOSHIBA MODEL 6TP-309Y

TOSHIBA MODEL 6TP-309Y

TOSHIBA MODEL 6TP-309Y

TRADE NAME	Toshiba Model 6TP-309Y
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	6MA @ 9 Volts DC (No Signal, Min. Volume) 8MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 — 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A5..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A4, A6..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC	"	A5	"
4.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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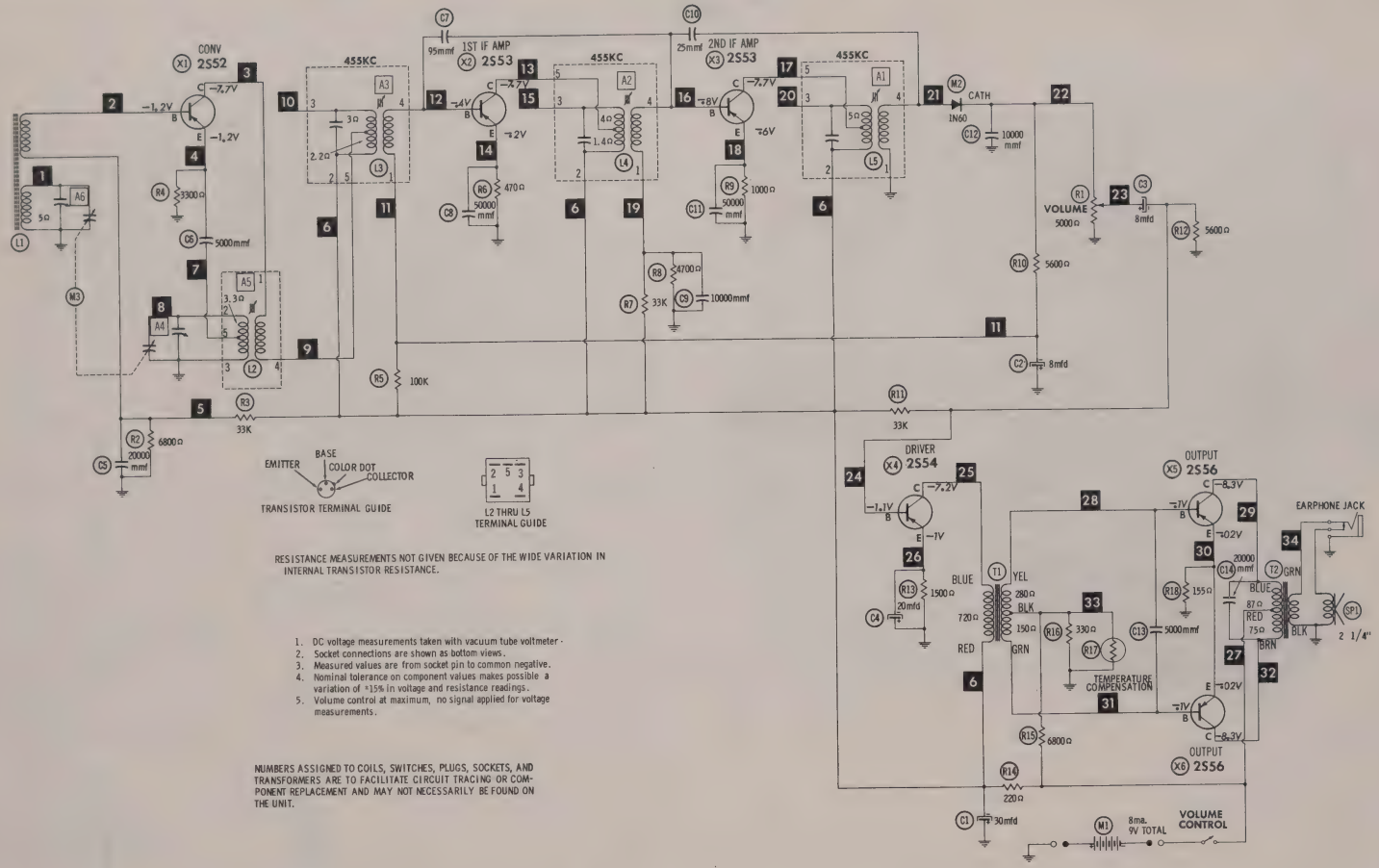
JF710

SET486 FOLDER 25



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

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TOSHIBA MODEL 6TP-309Y

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52	Converter		2N412	2N486	2N412	PNP
X2	2S53	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2S53	2nd IF Amplifier		2N410	2N483	2N410	PNP
X4	2S54	Driver		2N408	2N362	2N408	PNP
X5	2S56	Output		2N408	2N632	2N408	PNP } Matched
X6	2S56	Output		2N408	2N632	2N408	PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING,		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	30	10	10M30EH	XPP-10030	NLW30-15	TT15X30	ML30-15	TE-1158	
C2	8	3	8M8E	XPP-3008	NLW8-6	TT6X8	ML8-6	TE-1052.5	
C3	8	3	8M8E	XPP-3008	NLW8-6	TT6X8	ML8-6	TE-1052.5	
C4	20	3	8M20E	XPP-3020	NLW20-6	TT3X25	ML20-6	TE-1054	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C6	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C7	95		1469-0001	TCZ-100	22R5T1	CCTO-101	CNO-310	10TCC-T10
C8	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C9	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C10	25		1469-000025	TCZ-25	22R5Q25	CCTO-240	CNO-425	10TCC-Q25
C11	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C12	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C13	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C14	20000		C80V203AM	DDM-203	H-05S20		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	16T5K	B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	6800Ω	
R3	33K	
R4	3300Ω	
R5	100K	
R6	470Ω	
R7	33K	

ITEM No.	RATING	REMARKS
R8	4700Ω	
R9	1000Ω	
R10	5600Ω	
R11	33K	
R12	5600Ω	
R13	1500Ω	

ITEM No.	RATING	REMARKS
R14	220Ω	
R15	6800Ω	
R16	330Ω	
R17	Temp. Comp.	#M8601
R18	15Ω	

Toshiba Part Number

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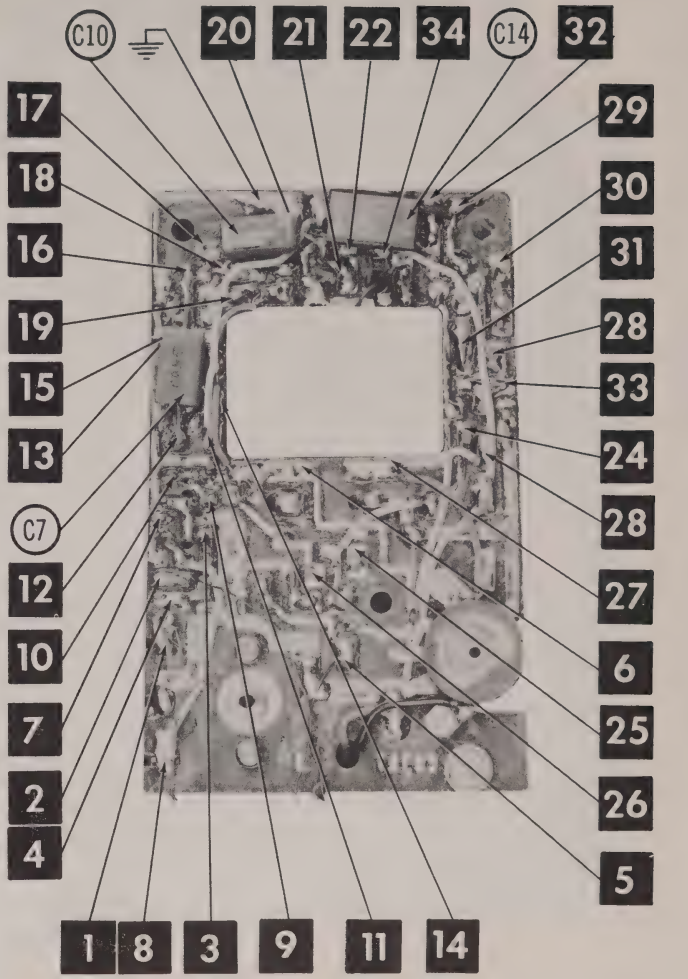


TOSHIBA MODEL 6TP-309Y

FOLDER 25

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TOSHIBA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	LH-205						
L2	Osc. Coil	LH-149						
L3	1st IF Trans.	IT-0735						
L4	2nd IF Trans.	IT-0736						
L5	3rd IF Trans.	IT-0737						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TOSHIBA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	.9	1	DT-0311B						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TOSHIBA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	18000Ω	8-10Ω	MT-0470B							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	2 1/4"	PM	8-10Ω	SP-2301A	22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TOSHIBA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	1N60	Detector (Pigtail)

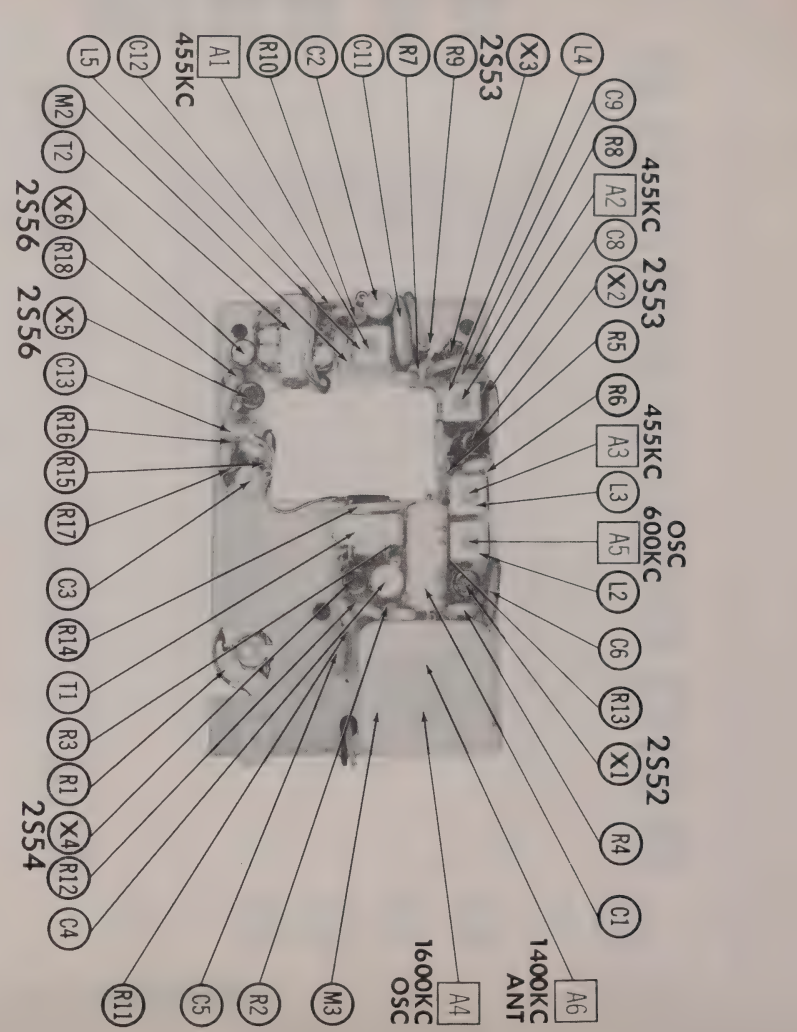
MISCELLANEOUS

ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M3	Tuning Cap.	VC-2029	2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

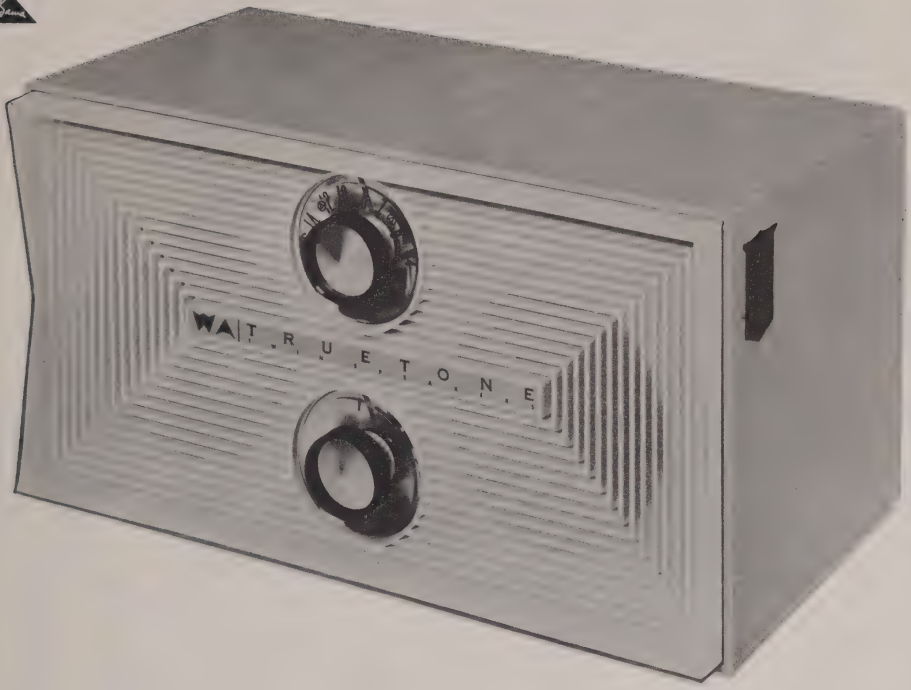
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

TRUETONE MODEL DC2036A

TRUETONE
MODEL DC2036A



TRUETONE
MODEL DC2036A

TRADE NAME	Truetone Model DC2036A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	AC-DC Operated AM Receiver
POWER SUPPLY	105 - 125 Volts AC-DC RATING 26 Watts, .25 Amp. @ 117 Volts AC
TUNING RANGE— BROADCAST	535 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3, A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 1 (grid) of Mixer. Low side to B .	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	Loop	1400KC	Tune to 1400KC signal.	"	A6	"

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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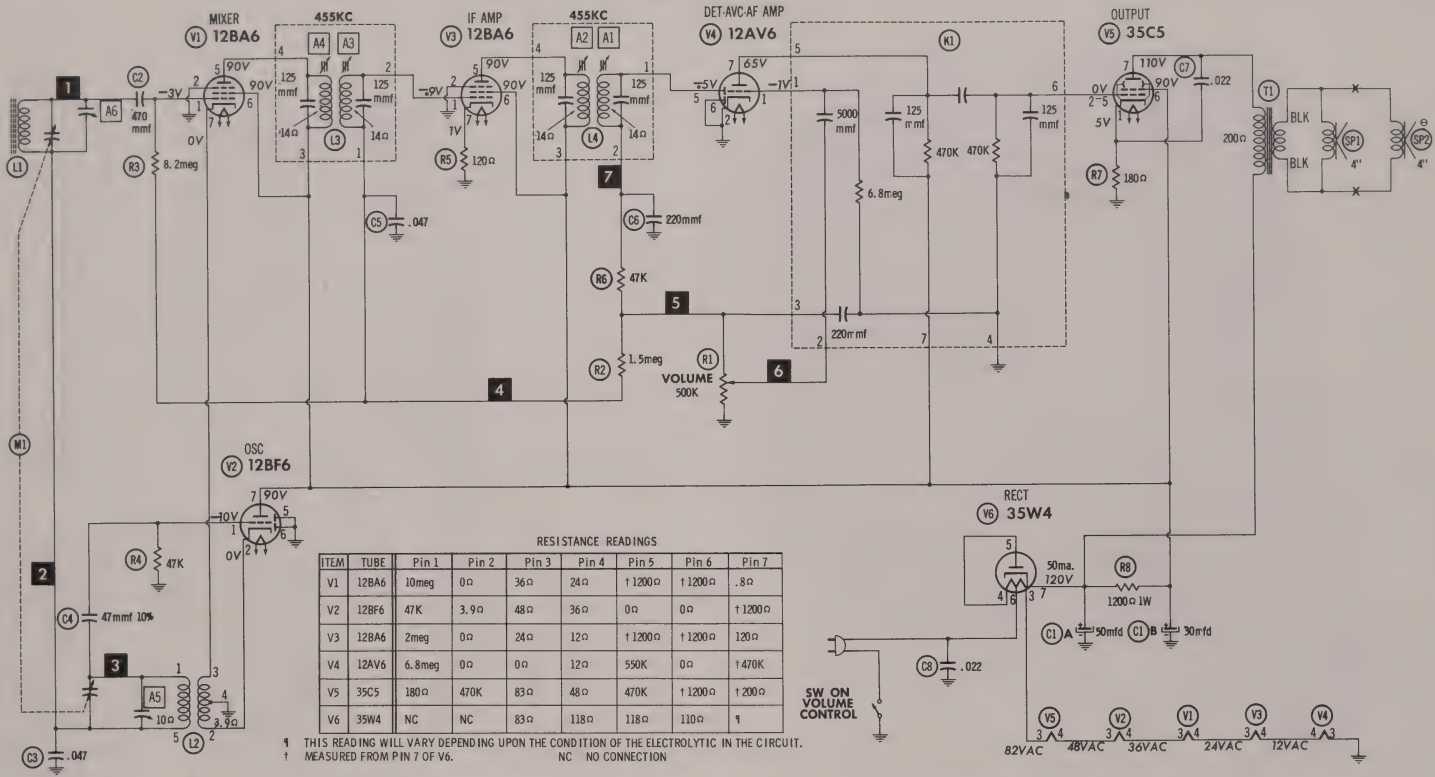
JG701

SET 486 FOLDER 26



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BA6	10meg	0Ω	36Ω	24Ω	†1200Ω	†1200Ω	.8Ω
V2	12BF6	47K	3.9Ω	48Ω	36Ω	0Ω	0Ω	†1200Ω
V3	12BA6	2meg	0Ω	24Ω	12Ω	†1200Ω	†1200Ω	120Ω
V4	12AV6	6.8meg	0Ω	0Ω	12Ω	550K	0Ω	†470K
V5	35C5	180Ω	470K	83Ω	48Ω	470K	†1200Ω	†200Ω
V6	35W4	NC	NC	83Ω	118Ω	118Ω	110Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V6. NC NO CONNECTION

L2 TERMINAL GUIDE

L3 & L4 TERMINAL GUIDE

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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TRUETONE MODEL DC2036A

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Mixer	12BA6
V2	Oscillator	12BF6
V3	IF Amplifier	12BA6
V4	Det. -AVC-AF Amp.	12AV6
V5	Output	35C5
V6	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	45X435	PRS2200	BBRD5315	WD210	TLDL-10	TVA-2460	
B	30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C3	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C4	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C7	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C8	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	500K	½	36X398					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1.5meg	
R3	8.2meg	
R4	47K	
R5	120Ω	
R6	47K	
R7	180Ω	
R8	1200Ω 1W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	76X12	Aerovox PA-512-3 Centralab PC-158 Sprague DT-5

PRINTED BOARD

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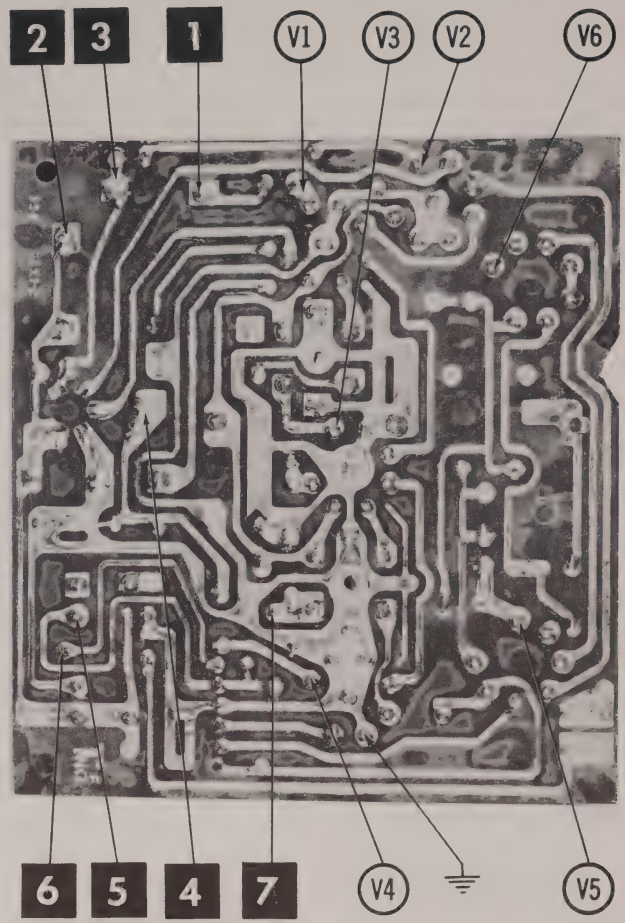
ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TRUETONE
MODEL DC2036A

FOLDER 26

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	9A2405			BC-419			
L2	Osc. Coil	9A2396						
L3	Input IF Trans.	9A2401	16-6780	16-6780	BC-356	13-PC9		
L4	Output IF Trans.	9A2402	16-6780	16-6780	BC-357	13-PC10		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	6-8Ω	51X184							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	12A541-1	4A1	① Not used in some versions.
SP2	4"	PM	3-4Ω	12A541-1 ①	4A1	

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Tuning Cap Printed Board	14A236 33485X1-2	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

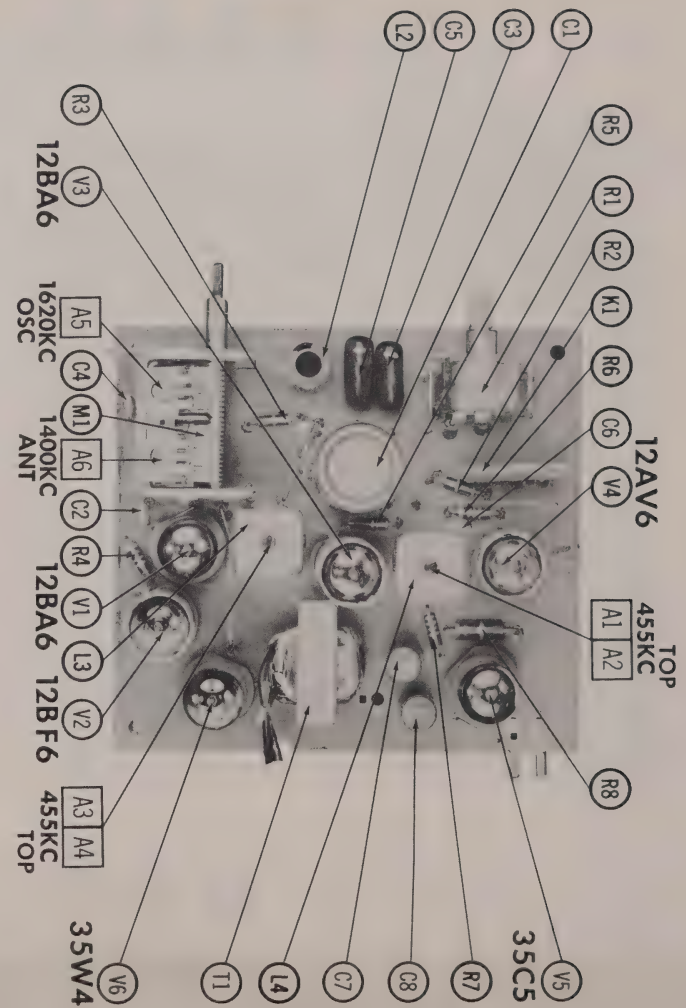
NAME	PART NO.	DESCRIPTION
Knob	10A911	Tuning
Knob	10A904	Off-On Volume
Knob	10A912-1	Dial Scale
Cabinet Front	26A640	Assembly
Cabinet Shell	26A641	Assembly

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord (Interlock Type) ..... Use BELDEN No. 8874

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

WESTINGHOUSE MODELS H-725P6, H-726P6, H-727P6, H-728P6 (Ch. V-2397-3)

WESTINGHOUSE MODELS H-725P6, H-726P6, H-727P6, H-728P6 (Ch. V-2397-3)

MODEL H-726P6

WESTINGHOUSE MODELS H-725P6, H-726P6, H-727P6, H-728P6 (Ch. V-2397-3)

TRADE NAME	Westinghouse Models H-725P6, H-726P6, H-727P6, H-728P6 (Ch. V-2397-3)		
MANUFACTURER	Westinghouse Electric Corp., Metuchen, N. J.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	8MA@6 Volts DC (No Signal, Min. Volume) 15MA@6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	535 – 1625KC		

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:
A1, A2..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A3..... GENERAL CEMENT #9440
A4, A5..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1625KC	"	"	A4	"
3.	"	1400KC	Tune to 1400KC signal.	"	A5	"
4.	"	600KC	Tune to 600KC Signal.	"	A6	If necessary, adjust for maximum output.

DISASSEMBLY

1. Remove volume control knob.
2. Remove tuning knob. (Loop sting under knob and pull up).
3. Remove screw located under tuning knob.
4. Loosen two screws from cabinet back. Remove back.
5. Remove 2 hex head chassis mounting screws.
6. Remove chassis & battery holder from cabinet.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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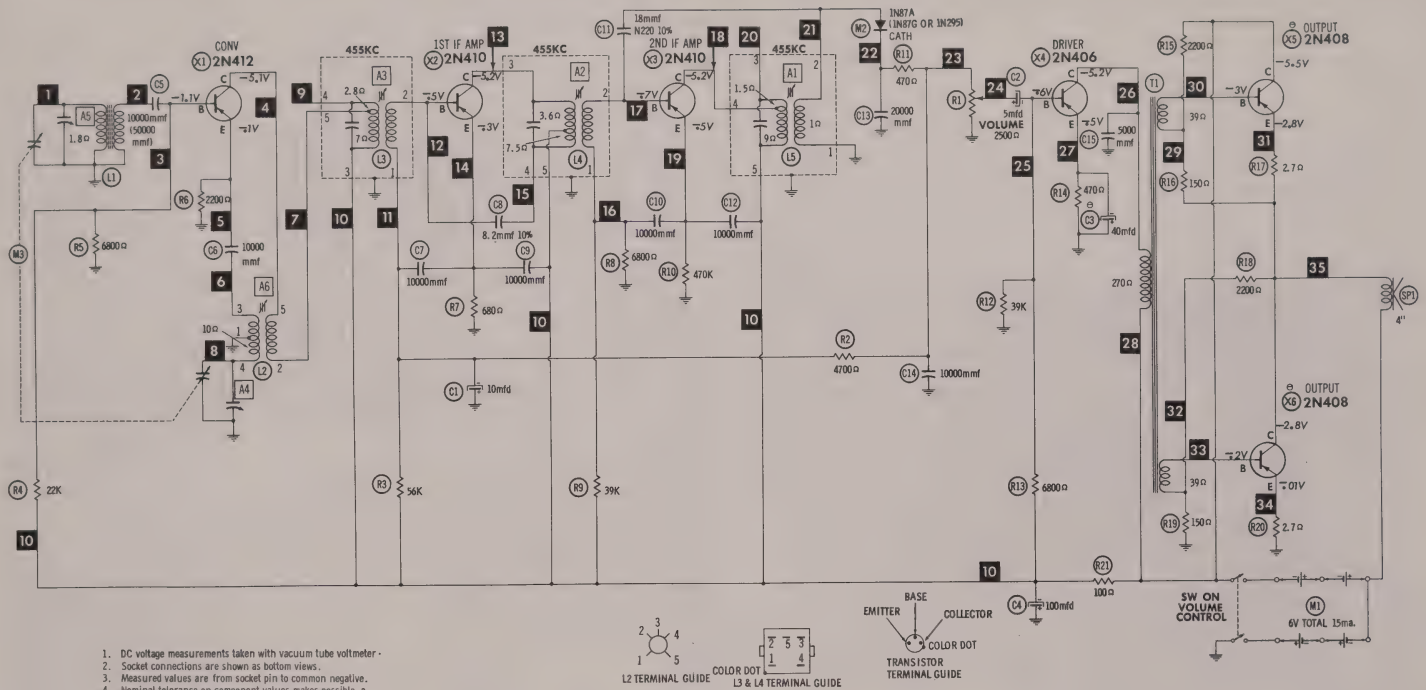
JF861

DATE 5–60 SET 486 FOLDER 27

SET 486 FOLDER 27



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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WESTINGHOUSE MODELS H-725P6, H-726P6, H-727P6, H-728P6 (Ch. V-2397-3)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N412	Converter		2N412	2N487	2N412	PNP
X2	2N410	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2N410	2nd IF Amplifier		2N410	2N483	2N410	PNP
X4	2N406	Driver		2N406	2N362	2N406	PNP
X5	2N408 *	Output		2N408	2N633	2N408	PNP) Matched
X6	2N408 *	Output		2N408	2N633	2N408	PNP) Pair

* Type #2N406 may be used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	3	218V012H16	PWE3010	EC10-3	TT3X10	ML10-6	TE-1053	
C2	5	12	218V012H09	PWE25005	EC5-15	TT12X5	ML5-15	TE-1127	
C3	40	3	218V012H02	PWE3040	EC40-3	TT3X40	ML40-6	TE-1057	Note 1
C4	100	7	218V012H15	PWE10100	EC100-10	TT15X100	ML100-15	TE-1119, 3	

Note 1. Some versions may use a 3 volt unit in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000	(50000) †	BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C8	8.2 10%		NPO-SI 8.2		C10V82C			10TCC-V82
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C11	18 N220 10%	#215V011A80				*		10TCR-Q18
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	GP120	5HK-S20
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50

† Alternate Value.
# Westinghouse Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2500Ω	½	270V084H01					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	
R3	56K	
R4	22K	
R5	6800Ω	
R6	2200Ω	
R7	680Ω	
R8	6800Ω	

ITEM No.	RATING	REMARKS
R9	39K	
R10	470Ω	
R11	470Ω	
R12	39K	
R13	6800Ω	
R14	470Ω	
R15	2200Ω	

ITEM No.	RATING	REMARKS
R16	150Ω	
R17	2, 7Ω	
R18	2200Ω	
R19	150Ω	
R20	2, 7Ω	
R21	100Ω	

PRINTED BOARD

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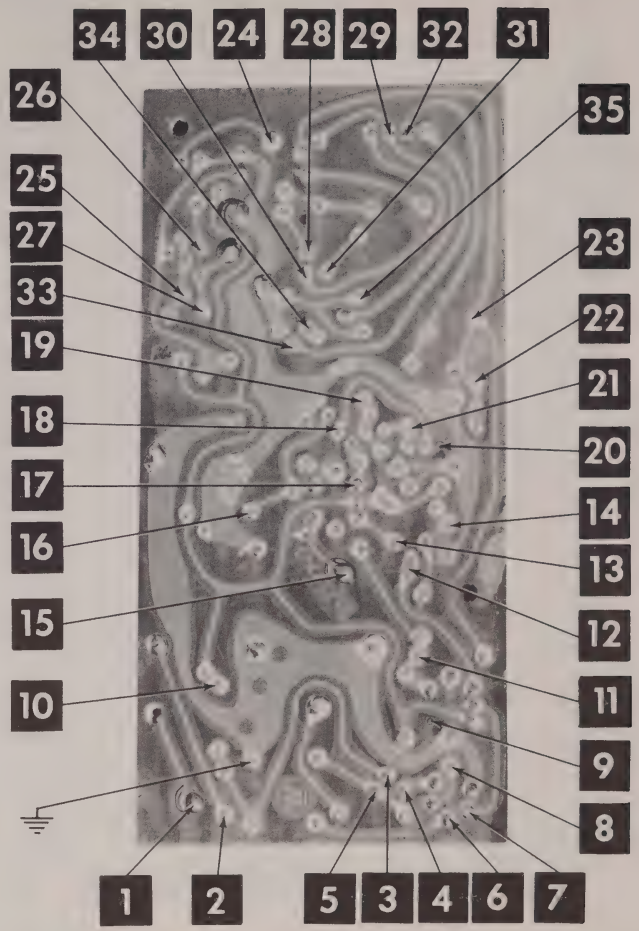

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Westinghouse PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	310V048H02	14-9013	14-9013		2003		
L2	Osc. Coil	230V057H02						
L3	1st IF Trans.	235V047H03						
L4	2nd IF Trans.	235V047H01						
L5	3rd IF Trans.	235V062H01						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3	1	430V076H01						
		SEC. 2							
		1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	44-48Ω	570V073H01		

BATTERIES

ITEM No.	VOLTAGE	Westinghouse PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	*		130 *		635 *		M-14R *	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Westinghouse PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N87A *	296V002H01	1N60	1N295	1N295	Detector (Pigtail)

* Alternate types: 1N87G, 1N295.

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3	Tuning Cap.	330V027H01	2 Gang

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V080H06	Tuning, Model H-726P6
Knob	550V080H05	Tuning, Model H-725P6
Knob	550V080H07	Tuning, Model H-727P6
Knob	550V080H08	Tuning, Model H-728P6
Knob	550V098H03	Volume
Cabinet Front	513V039H03	White; Models H-725P6, H-726P6
Cabinet Front	513V039H07	Mist Green, Model H-727P6
Cabinet Front	513V039H08	Charcoal, Model H-728P6
Cabinet Back	513V039H04	Red, Model H-725P6
Cabinet Back	513H039H05	White; Models H-727P6, H-728P6
Cabinet Back	513V039H06	Turquoise, Model H-726P6
Handle	558V217H01	White; Models H-725P6, H-726P6
Handle	558V217H02	Mist Green, Model H-727P6
Handle	558V217H03	Charcoal, Model H-728P6

CHASSIS—TOP VIEW

PHOTOFACT® Folder with CIRCUITRACE®

ZENITH MODELS Royal 275B, F, J, Y (Ch. 7CT40Z1, 7CT40Z2)

ZENITH MODELS Royal 275B, F, J, Y (Ch. 7CT40Z1, 7CT40Z2)

MODEL Royal 275F

TRADE NAME	Zenith Models Royal 275B, Royal 275F, Royal 275J, Royal 275Y (Ch. 7CT40Z1, 7CT40Z2)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	6MA @ 6 Volts DC (No Signal, Min. Volume) 15MA @ 6 Volts DC (Signal, Normal Volume)
TUNING RANGE	BROADCAST 535-1620KC		

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: Al thru A6 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	535KC	Tuning gang fully closed	"	A5	"
4.	"	1260KC	Tune to 1260KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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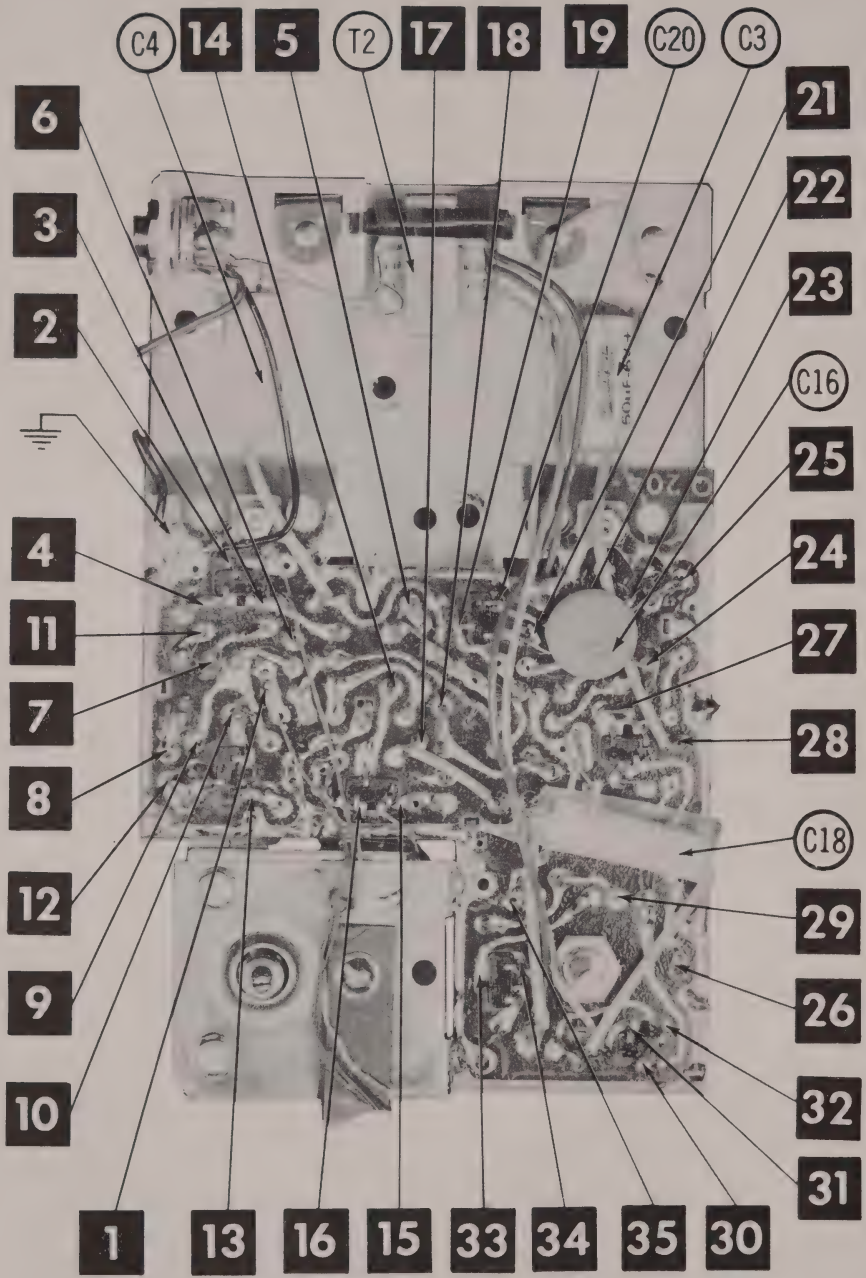
SET 486 FOLDER 28



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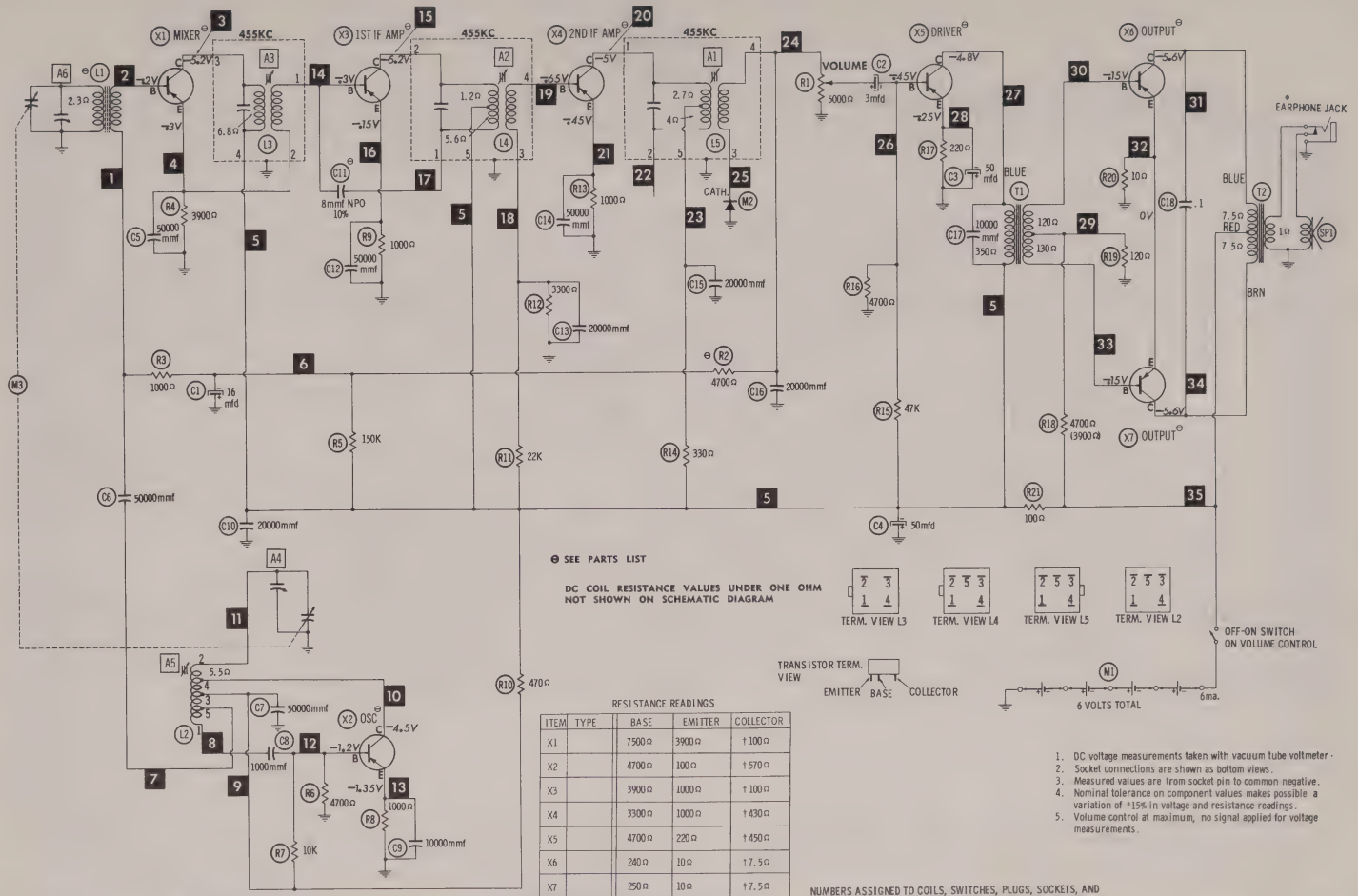
PRINTED BOARD



⊖ SEE PARTS LIST

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1		7500Ω	3900Ω	†100Ω
X2		4700Ω	100Ω	†570Ω
X3		3900Ω	1000Ω	†100Ω
X4		3300Ω	1000Ω	†430Ω
X5		4700Ω	220Ω	†450Ω
X6		240Ω	10Ω	†7.5Ω
X7		250Ω	10Ω	†7.5Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R18 AND R21.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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ZENITH MODELS Royal 275B, F, J, Y (Ch. 7CT40Z1, 7CT40Z2)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART No.	USE	REPLACEMENT DATA: CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	121-54 ①	Mixer			2N486	2N140	PNP
X2	121-53 ②	Oscillator			2N485		PNP
X3	121-67 ③	1st IF Amplifier			2N483		PNP
X4	121-113 ④	2nd IF Amplifier			2N483		PNP
X5	121-52 ⑤	Driver		2N406	2N362	2N407	PNP
X6	121-19 ⑥	Output			2N633		PNP) Matched
X7	121-19 ⑥	Output			2N633		PNP) Pair

① Part #121-62 used on chassis 7CT40Z2 in this application.
② Part #121-65 used on chassis 7CT40Z2 in this application.
③ Part #121-73 used on chassis 7CT40Z2 in this application.
④ Part #121-74 used on chassis 7CT40Z2 in this application.
⑤ Part #121-64 used on chassis 7CT40Z2 in this application.
⑥ Part #121-61 used on chassis 7CT40Z2 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	16	3	22-2871	PWE3010	NLW208	TT3X10	ML10-6	TE-1053.5	
C2	3	12	22-2884	PWE25003	NLW3-25	TT12X3	ML4-15	TE-1122	
C3	50	6	22-2726	PWE6050	NLW50-10	TT6X50	ML50-6	TE-1100	
C4	50	6	22-2726	PWE6050	NLW50-10	TT6X50	ML50-6	TE-1100	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	50000		C80V503AM	DA-503	H-05S1		TA-150	TG-S50
C6	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C7	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C8	1000		BPD-001	DM-102	H-05D1	CCD-102	GP20	10TS-D10
C9	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C10	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C11	8 NPO 10%	Note 1	NPO-DI 8.2		C10V8C			10TCC-V8
C12	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C13	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S10
C14	50000		C80V503AM	DA-503	H-05S5		TA-150	TG-S50
C15	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C16	20000		C80V203AM	DA-203	H-05S2		TA-120	TG-S20
C17	10000		C80V103AM	DM-103	H-05S1		TA-110	TG-S10
C18	.1 50V		V84C2P1	DDA-104	H-05P1		BT-010	2WF-P10

Note 1. Chassis 7CT40Z2 uses 12mmf-NPO-10% in this application (Part #22-3157).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A B	5000Ω Switch	1/4	63-4602					Volume Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	Note 1
R3	1000Ω	
R4	3900Ω	
R5	150K	
R6	4700Ω	
R7	10K	
R8	1000Ω	

ITEM No.	RATING	REMARKS
R9	1000Ω	
R10	470Ω	
R11	22K	
R12	3300Ω	
R13	1000Ω	
R14	330Ω	
R15	47K	

ITEM No.	RATING	REMARKS
R16	4700Ω	
R17	220Ω	
R18	4700Ω	(3900) *
R19	120Ω	
R20	10Ω	
R21	100Ω	

Note 1. Chassis 7CT40Z2 uses 6800Ω in this application.

* Alternate

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	S-46794 ①	14-9005	14-9005				
L2	Osc. Coil	95-1675						
L3	1st IF Trans.	95-1600	16-9003 †	16-9003 †				
L4	2nd IF Trans.	95-1601	16-9003	16-9003				
L5	3rd IF Trans.	95-1602	16-9004	16-9004				

① Chassis 7CT40Z2 uses Part #S-46800.

† Remove Pin #6

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	TURNS RATIO: SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1	1	95-1518						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	425Ω CT	16-18Ω	95-1519	TR-18				TR-18		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	2 3/4"	PM	16-18Ω	49-891	27A06Z16.6	

BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	Z-8 * Z-9 ♦		Z *		1015 *		M-15R *	* 4 Required ♦ Mercury, 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		ZENITH PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2		103-19	1N295	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-3011	2 Gang

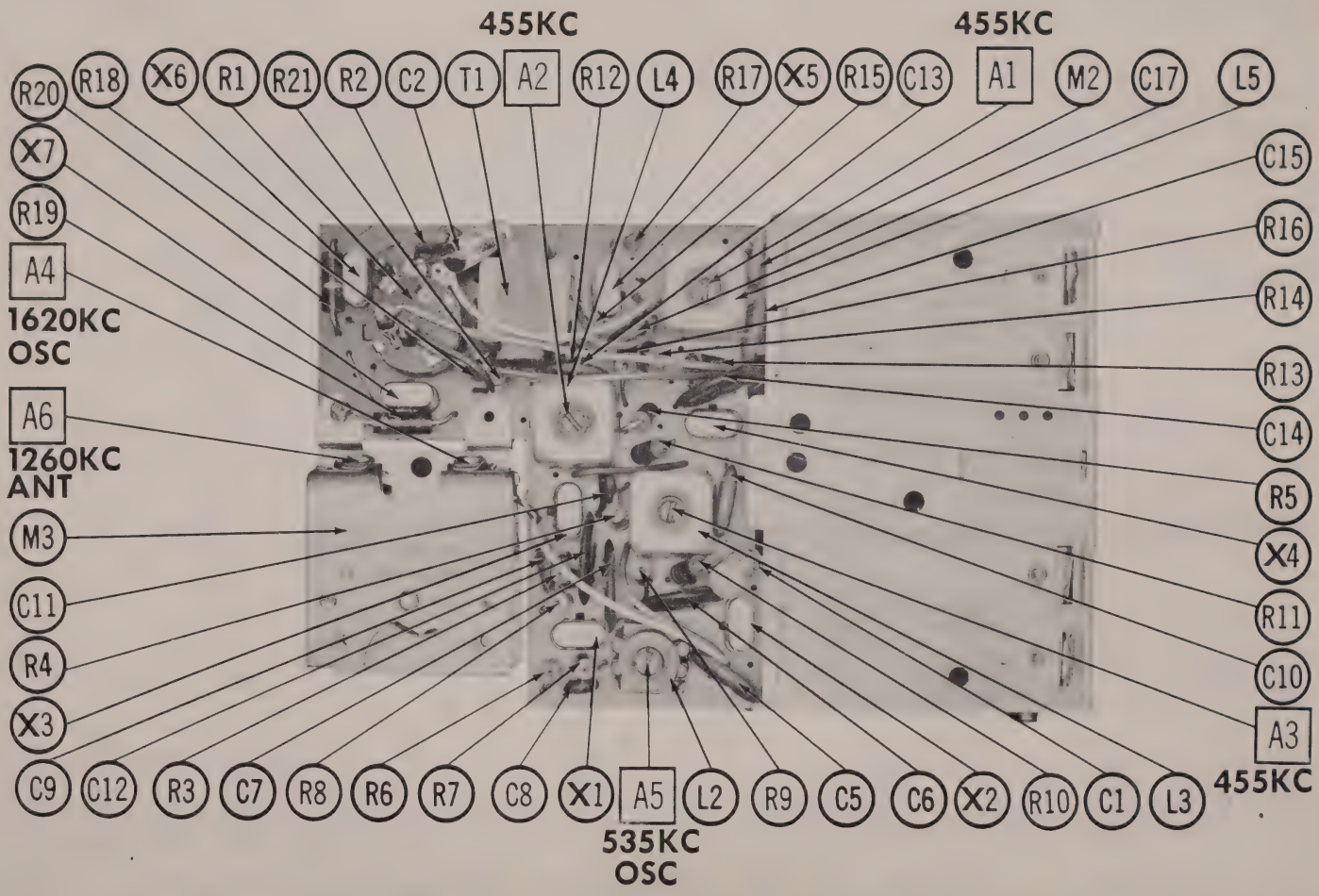
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

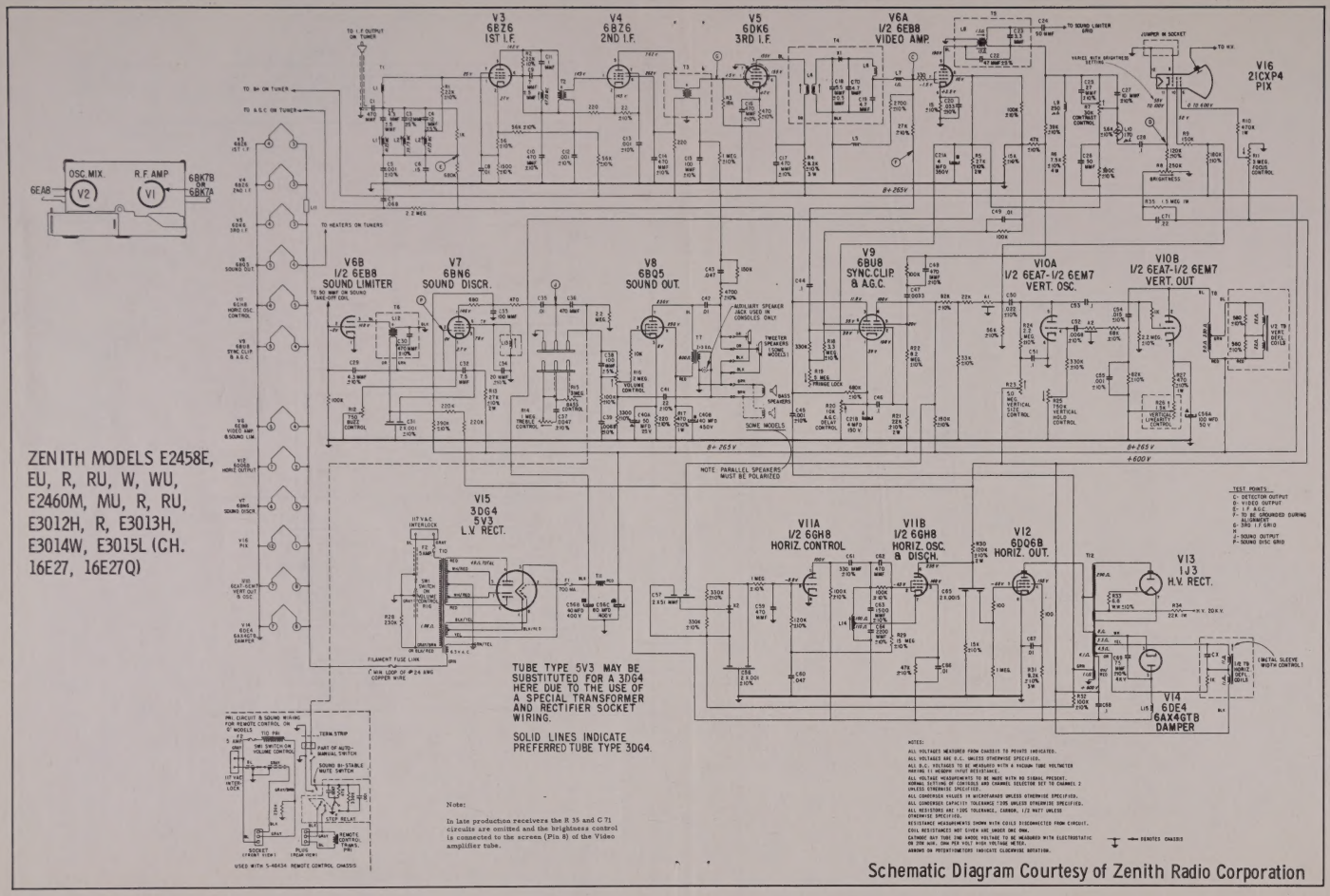
NAME	PART NO.	DESCRIPTION
Knob	46-2237	Tuning
Knob	S-46804	Volume, Includes Ring Assembly
Dial Scale	S-46811	Includes Bushing Assembly
Cabinet Front	S-47045	Royal 275F
Cabinet Front	S-47047	Royal 275B
Cabinet Front	S-47049	Royal 275J
Cabinet Front	S-46810	Royal 275Y
Cabinet Rear	12-2743	Royal 275Y
Cabinet Rear	12-2744	Royal 275F
Cabinet Rear	12-2747	Royal 275B
Cabinet Rear	12-2748	Royal 275J
Handle	36-243	

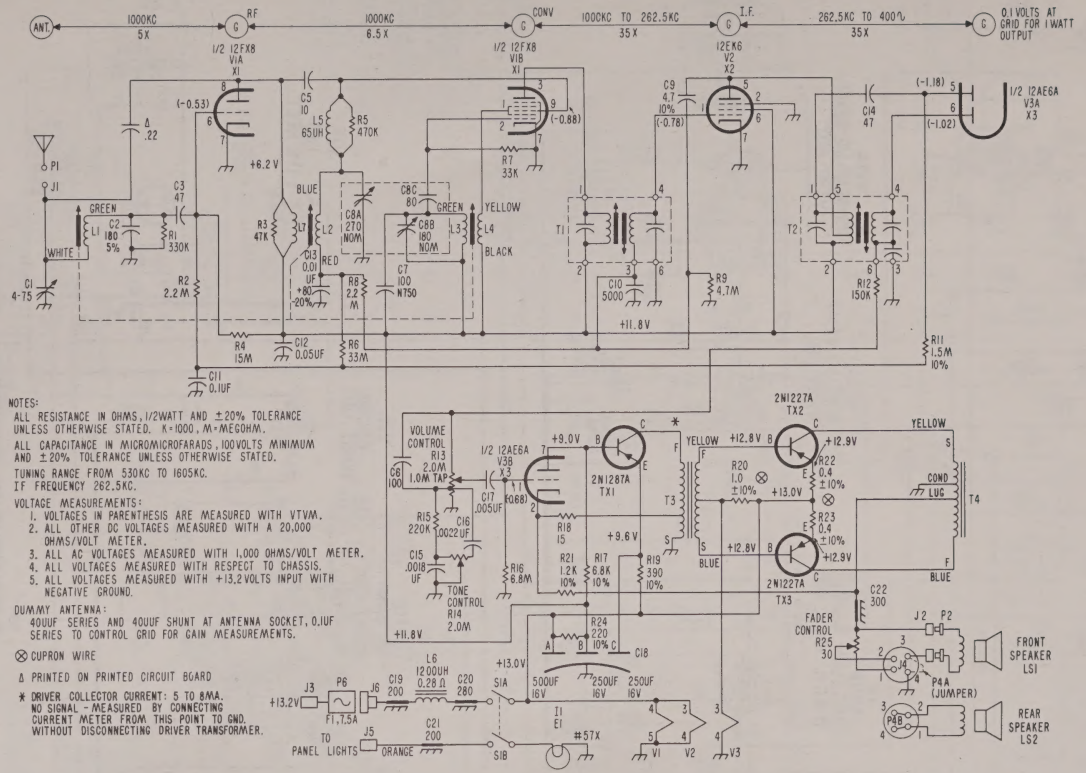
WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



CHASSIS TOP VIEW


ZENITH MODELS E2458E, EU, R, RU, W, WU, E2460M, MU, R, RU, E3012H, R, E3013H, E3014W, E3015L (CH. 16E27, 16E27Q)
OSC. MIX. 6EA8 V2
R.F. AMP. 6BK7B V1 6BK7A
V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6DK6 3RD I.F.
V6A 1/2 6EB8 VIDEO AMP.
V16 21CXP4 PIX
V6B 1/2 6EB8 SOUND LIMITER
V7 6BN6 SOUND DISCR.
V8 6BQ5 SOUND OUT.
V9 6BU8 SYNC.CLIP & A.G.C.
V10A 1/2 6EA7-1/2 6EM7 VERT. OSC.
V10B 1/2 6EA7-1/2 6EM7 VERT. OUT
V15 3DG4 5V3 L.V. RECT.
V11A 1/2 6GH8 HORIZ. CONTROL
V11B 1/2 6GH8 HORIZ. OSC. & DISCH.
V12 6DQ6B HORIZ. OUT.
V13 1J3 H.V. RECT.
V14 6DE4 6AX4GTB DAMPER
TUBE TYPE 5V3 MAY BE SUBSTITUTED FOR A 3DG4 HERE DUE TO THE USE OF A SPECIAL TRANSFORMER AND RECTIFIER SOCKET WIRING.
SOLID LINES INDICATE PREFERRED TUBE TYPE 3DG4.
NOTE: PARALLEL SPEAKERS MUST BE POLARIZED
B+ 265 V
+600 V
Note:
In late production receivers the R 35 and C 71 circuits are omitted and the brightness control is connected to the screen (Pin 8) of the Video amplifier tube.
USED WITH 5-46434 REMOTE CONTROL CHASSIS
Schematic Diagram Courtesy of Zenith Radio Corporation



NOTES:
ALL RESISTANCE IN OHMS, 1/2WATT AND ±20% TOLERANCE UNLESS OTHERWISE STATED. K=1000, M=MEGOHM.
ALL CAPACITANCE IN MICROMICROFARADS, 100VOLTS MINIMUM AND ±20% TOLERANCE UNLESS OTHERWISE STATED.
TUNING RANGE FROM 530KC TO 1605KC. IF FREQUENCY 262.5KC.
VOLTAGE MEASUREMENTS:
1. VOLTAGES IN PARENTHESIS ARE MEASURED WITH VTVM.
2. ALL OTHER DC VOLTAGES MEASURED WITH A 20,000 OHMS/VOLT METER.
3. ALL AC VOLTAGES MEASURED WITH 1,000 OHMS/VOLT METER.
4. ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS.
5. ALL VOLTAGES MEASURED WITH +13.2VOLTS INPUT WITH NEGATIVE GROUND.

DUMMY ANTENNA:
400UUF SERIES AND 400UUF SHUNT AT ANTENNA SOCKET, 0.1UF SERIES TO CONTROL GRID FOR GAIN MEASUREMENTS.

⊗ CUPRON WIRE
Δ PRINTED ON PRINTED CIRCUIT BOARD
* DRIVER COLLECTOR CURRENT: 5 TO 8MA. NO SIGNAL - MEASURED BY CONNECTING CURRENT METER FROM THIS POINT TO GND. WITHOUT DISCONNECTING DRIVER TRANSFORMER.

Schematic Diagram Courtesy of Bendix Radio, Division of Bendix Aviation Corp.

MOPAR MODELS 303 (03BC) 305 (03BD)

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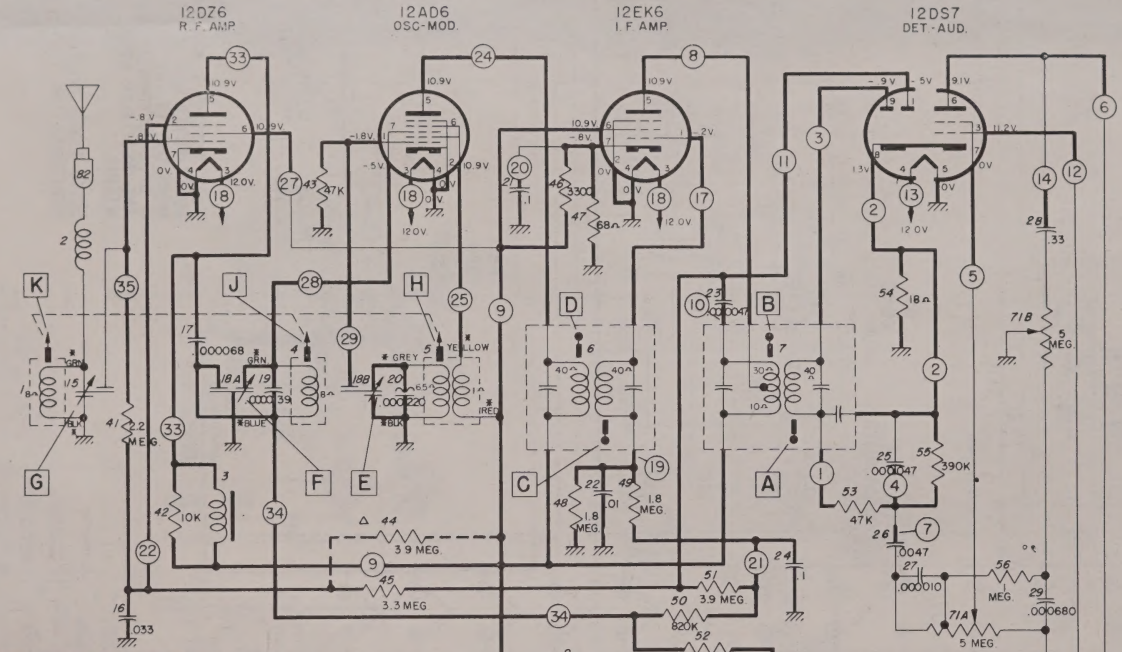
PONTIAC MODEL 989614



VOLTAGES MEASURED TERMINAL TO CHASSIS WITH A VTVM – NO SIGNAL AND 12.0 VOLTS AT ILLUS. 30.

OSCILLATOR GRID VOLTAGE TAKEN WITH SET TUNED TO 1000 KC.

TOTAL "A" DRAIN AT 12 V. – 2.2 AMPS.

TOLERANCE ON VOLTAGES ± 10 %.

* – INDICATES LEAD FROM TUNER COIL ASS'Y.

** – BEFORE MEASURING TRANSISTOR VOLTAGES THE SHORTING TYPE SPEAKER SOCKET MUST BE OPENED AND A 4 OHM SPEAKER CONNECTED. IF TRANSISTOR IS REPLACED, ADJUST BIAS POTENTIOMETER (ILLUS. 73) TO OBTAIN PROPER COLLECTOR VOLTAGE WITH 12 VOLTS INPUT TO RADIO.

† – ILLUS. 59 IS A FUSE RESISTOR FOR THE TRANSISTOR.

△ – THIS PART WILL NOT APPEAR IN ALL RADIOS.

□ – OUTPUT TRANSFORMER WILL APPEAR SHORTED IF SHORTING TYPE SPEAKER SWITCH IS NOT OPENED.

IMPORTANT

THE SPEAKER SOCKET, MOUNTED ON OUTPUT TRANSFORMER, IS A SHORTING-TYPE AND MUST BE MECHANICALLY OPENED WHEN TESTING RADIO ON BENCH.

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.